

## ABSTRACT

Title of Document: Rapport and Its Impact on the Disclosure of  
Sensitive Information in Standardized Interviews

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Although there is no universally accepted way to define and operationalize rapport, the general consensus is that it can have an impact on survey responses, potentially affecting their quality. Moderately sensitive information is often asked in the interviewer-administered mode of data collection. Although rapport-related verbal behaviors have been found to increase the disclosure of moderately sensitive information in face-to-face interactions, it is unknown if rapport can be established to the same extent in video-mediated interviews, leading to similar levels of disclosure. Highly sensitive information is usually collected via self-administered modes of data collection. For some time, audio computer-assisted self-interviewing (ACASI) has been seen as one of the best methods for collecting sensitive information. Typically, the respondent first answers questions about nonsensitive topics in computer-assisted personal interviewing (CAPI) and is then switched to ACASI for sensitive questions. None of the existing research has investigated the possibility that the interviewer-

respondent interaction, prior to the ACASI questions, may affect disclosures in ACASI.

This dissertation used a laboratory experiment that was made up of two related studies, aiming at answering these questions. The first study compares video-mediated interviews with CAPI to investigate whether rapport can be similarly established in video-mediated interviews, leading to similar levels of disclosure. There was no significant difference in rapport ratings between video-mediated and CAPI interviews, suggesting no evidence that rapport is any better established in CAPI than video-mediated interviews. Compared with CAPI, higher disclosure of moderately sensitive information was found in video-mediated interviews, though the effects were only marginally significant.

The second study examines whether the interviewer-respondent interaction, prior to the ACASI questions, may affect disclosure in ACASI. There was no significant difference on disclosure between the same voice and the different voice condition. However, there were marginally significant carryover effects of rapport in the preceding module on disclosure in the subsequent ACASI module. Respondents who experienced high rapport in the preceding module gave more disclosure in the subsequent ACASI module. Furthermore, compared with ACASI, the percentage of reported sensitive behaviors was higher for video-mediated interviews for some of the highly sensitive questions.

RAPPORT AND ITS IMPACT ON THE DISCLOSURE OF SENSITIVE  
INFORMATION IN STANDARDIZED INTERVIEWS

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## Chapter 1 Introduction

Rapport is generally described as a sense of connection, mutual comfort and ease of conversational coordination during an interaction (Foucault, 2010). During a high-rapport interaction, participants have intense mutual interest in and connect with one another, attach to and care about one another and are “in sync” with one another (Tickle-Degnen & Rosenthal, 1990). Although there is no universally accepted way to measure rapport, the general consensus is that it is good for survey interviews and may affect the quality of the responses obtained (e.g., Foucault, 2010; Lavin & Maynard, 2001; Cassell & Miller, 2007).

A few studies have examined rapport-related verbal behaviors and have found that respondents disclose more sensitive information in personal interviewing conditions in which the interviewer appears to be supportive and understanding (e.g., Dijkstra, 1987). In a strictly standardized interview, however, interviewers follow a script of questions and probes written by the survey designer. With standardized interviews, the respondent’s sense of rapport was found to be greater when the interviewer smiled and nodded more often, and when they gazed directly at the respondent less often (Foucault, 2010). Little is known about the impact of rapport on data quality with standardized interviewing. For example, it is unknown whether higher rapport will elicit more or fewer disclosures of sensitive information.

It seems plausible that the effect of rapport on sensitive disclosure is mediated by the sensitivity of the survey questions. Technological advances in recent years have made video-mediated interviews more feasible and affordable; however, little attention has been paid to videoconferencing as a potential mode of data collection. In video-mediated interviews, the interviewer and the respondent can see and talk to

each other via a video window. Video-mediated interviews provide several potential advantages for surveys. Respondents of video-mediated interviews may feel more engaged or connected than those in telephone interviews due to a greater sense of social presence. This may lead to higher completion rates and better data quality. It is a cost-saving alternative to in-person interviews, especially when interviewing geographically dispersed respondents. Additionally, there may be certain types of questions that especially benefit from social distance through video-mediated interviews instead of face-to-face interviews. However, these hypotheses have, so far, not been tested empirically. Although rapport-related verbal behaviors have been found to increase the disclosure of moderately sensitive information in face-to-face interactions (e.g., van der Zouwen, Dijkstra, & Smit 1991), it is unknown if rapport can be established to the same extent in video-mediated interviews, leading to similar levels of disclosure.

Highly sensitive information is usually collected via self-administered modes of data collection. For some time, audio computer-assisted self-interviewing (ACASI) has been seen as one of the best methods for collecting information about topics such as illicit drug use or sexual behaviors. Typically, the respondent first answers questions about nonsensitive topics in computer-assisted personal interviewing (CAPI) and is then switched to ACASI for sensitive questions. The general finding is that ACASI increases disclosures of sensitive information relative to CAPI (e.g., Tourangeau & Smith, 1996). In these studies, ACASI is treated as an independent mode of data collection, even though the ACASI module follows a CAPI module. None of the existing research has investigated the possibility that the interviewer-respondent interaction, prior to the ACASI questions, may affect disclosures in ACASI.

This dissertation describes two studies, the results of which will improve our understanding of what rapport is and how it affects the disclosure of sensitive information, as well as how this unfolds in different modes of data collection. The results of the studies also could affect how interviewers are trained and how both interviewer- and computer-administered questions are delivered in the same interview. The first study compares video-mediated interviews with face-to-face interviews in a laboratory experiment to investigate (1) whether rapport can be similarly established in video-mediated and computer-assisted personal interviews (CAPI); and (2) whether video-mediated interviews increase the disclosure of moderately sensitive information to the same extent as CAPI. The second study examines whether the interviewer-respondent interaction, prior to the ACASI questions, may affect disclosure in ACASI in a laboratory experiment in which the respondent first completes a 35 minute CAPI interview – plenty of time to develop rapport – and then completes a 15 minute ACASI interview.



## Chapter 2 Literature Review

### *2.1 Rapport in Survey Interviews*

#### 2.1.1 Previous Research of Rapport in Survey Interviews

Building a good relationship with respondents, or the establishment of rapport, is frequently mentioned as important in interviewer training materials (e.g., Adams, 1958), and it is often speculated that it affects the quality of data obtained in survey interviews. Among previous research on rapport in survey interviews and its impact on survey responses, however, the findings are inconsistent, primarily due to little consistency in how rapport was defined and operationalized. Hyman (1954) argued that rapport or “overly friendly” behaviors may bias responses because it motivates respondents to ingratiate, rather than to provide honest responses. Hill and Hall (1963) and Weiss (1968) found that higher rapport is related to lower data validity. However, Williams (1968) found that interviewers with high rapport are more likely to collect honest responses when holding a measure of interviewer’s task-oriented behaviors constant. On other occasions, rapport was found to have no effect on the accuracy of reporting (Belli, Lepkowski, & Kabeto, 1999; Henson, Cannell, & Lawson, 1976).

In previous studies, as DePaulo and Bell (1990) noted, rapport was usually operationalized as only the interviewer’s perception of the degree to which the respondents felt positively about the interaction. This approach ignores the fact that rapport is a mutual interactive experience and both interactants must report feeling positivity, attentiveness and coordination (Cappella, 1990; DePaulo & Bell, 1990; Tickle-Degnen & Rosenthal, 1990). Although an individual may be particularly adept at building rapport under certain circumstances, rapport, by its nature, is an interactive

dynamic phenomenon, rather than a personality trait of one or both conversational partners. As Tickel-Dengen and Rosenthal (1990, p286) suggested, “Individuals experience rapport as the result of a combination of qualities that emerge from each individual during [an] interaction.” Rapport is a genuinely interactive phenomenon that only exists in interactions between conversational partners. The establishment of rapport must involve both conversational partners and can never be achieved by just one person. It is something that both the conversational partners experience together and that cannot be simply attributed to a certain personality trait. When measuring rapport, this seems to suggest that only evaluations given by the conversational partners of a particular interaction can truly capture the interactive dynamic nature of the rapport established in that interaction.

Although rapport has long been acknowledged as a construct that is difficult to define and operationalize, it is considered to be important in survey interviews and may increase the cooperation between interviewers and respondents. For example, Henson et al. (1976) compared the effects of a personal, understanding interviewing style to a task-oriented, businesslike style on response accuracy and completeness with a sample of people who had had an automobile accident within the past three years, which resulted in injury. Although no significant differences on response accuracy were found, respondents interviewed in the personalized interactive interviewing style gave significantly more information on open-ended health status questions than respondents interviewed in the task-oriented interviewing style. It seems plausible that rapport-motivated respondents were more cooperative, and therefore, they provided more complete information.

Rapport also may improve the disclosure of sensitive information in survey interviews. For instance, Cannell and Axelrod (1956, p181) argued that when rapport is high,

the respondent will give information which the interviewer desires, even though acutely personal, as a means of maintaining the enjoyable personal connection with the interviewer....[T]he interviewer, establishing a permissive atmosphere, provides the respondent an opportunity to express himself to a receptive listener.

Likewise, Holbrook, Green, and Krosnick (2003) found fewer socially desirable responses in face-to-face interviews than in telephone interviews and argued that rapport was probably established during the lengthy face-to-face interaction, and therefore, motivated respondents to work harder and disclose more. Some evidence supported this argument.

A few studies examined rapport-related verbal behaviors and their impact on the disclosure of sensitive information. Dijkstra (1987) investigated the effect of different interviewing styles on responses by training interviewers who used either a personal or a task-oriented style to administer survey questions. Interviewers using the personal interviewing style were instructed to build a good relationship or rapport with respondents by expressing a supportive and understanding attitude with personal statements, such as, "How nice for you!," whereas interviewers using the task-oriented interviewing style were taught to focus on the information-gathering aspect of the interview by acting in a neutral fashion. During the interview, the respondents were asked to sketch a map of a part of the town where they lived and to estimate the distance between their home and various places in the neighborhood. Dijkstra (1987)

found that interviewers trained in the personal interviewing style obtained more accurate map drawing and distance estimation than interviewers trained in the task-oriented style. In addition, compared to respondents interviewed in the task-oriented interviewing style, respondents interviewed in the personal interviewing style gave significantly fewer socially desirable responses to items of a modified version of the Marlowe-Crowne scale. It was unclear, however, whether the personal interviewing style led to increased rapport during the interview. Other factors, such as politeness and liking, may be confounded with rapport in the personal interviewing style.

van der Zouwen et al. (1991) conducted a follow-up study in which the same personal or task-oriented interviewing styles were used. Respondents interviewed in the personal interviewing style gave more socially undesirable responses than respondents interviewed in the task-oriented style when they were asked about moderately sensitive information on neighborhood relationships (“After moving to this neighborhood, did you try to make contact with people living here?; “If other people in this neighborhood try to make contact with you, do you generally comply with such an effort?; and “Are there people living in this neighborhood who you do not like?”). Additionally, respondents interviewed in the personal interviewing style gave fewer “don’t know” responses than respondents interviewed in the task-oriented style. After the interview, respondents were asked to rate their interviewers on a scale measuring rapport, including items like “The interviewer was very understanding” and “The interviewer acted very personally.” Respondents interviewed in the personal interviewing style gave the most favorable judgments of their interviewers. It seems that interviewers who received higher rapport scores also obtained more valid information than interviewers with lower scores.

Both Dijkstra (1987) and van der Zouwen et al. (1991) found that respondents disclose more sensitive information when they are interviewed in the personal interviewing style, which promotes rapport establishment. However, survey questions used in these two studies were only moderately sensitive (e.g., satisfaction with housing and the neighborhood and relationships with neighbors). It seems possible that respondents may disclose less if the questions are highly sensitive (e.g., drunk driving and sexual behaviors). Additionally, little is known about what exactly happened between the interviewers and the respondents in interviews with the personal interviewing style, which created the higher sense of rapport. Is rapport correlated with particular verbal or non-verbal behaviors in an interview? How does rapport evolve during the course of the interaction: Is it relatively stable or a dynamic structure? Two studies shed some light on this issue.

Houtkoop-Steenstra (1997) examined the linguistic features associated with the spontaneous use of a personal interviewing style, using behavioral coding and conversation analysis of eight interviews with Dutch adults who attended a basic literacy program. The questionnaire asked for information on reading ability and problems due to poor reading skills, which could potentially be sensitive to those respondents. Houtkoop-Steenstra (1997) found that the personal interviewing style occurs when the respondent provides assessable statements, and then, the interviewer responds (e.g., the respondent said that she will soon pass to a higher education level, the interviewer responded by saying “Oh that’s very good!” (Houtkoop-Steenstra, 1997, p. 595)), as well as when the interviewers ask questions of the respondents. The interviewers asked questions in a fashion that displayed an optimistic view of the respondents. They tended to rephrase items into leading questions to project no-problem answers and to allow the respondents to save face (e.g., the interviewer

reformulates the question stem “How well can you do this? Well, reasonably well, badly” into “And that goes all right too?” (Houtkoop-Steenstra, 1997, p. 612)). Under these circumstances, respondents may avoid making embarrassing disclosures, and therefore, they maintain a positive self-image. However, this undermines the validity of survey responses.

Non-verbal behaviors have been speculated to correlate with rapport establishment (e.g. Lavin & Maynard, 2001; Tickle-Degnen & Rosenthal, 1990). Foucault (2010) examined three interviewer non-verbal behaviors (smiling, nodding and direct gazes) and their relationship with respondent-assessed rapport. She video-recorded eight survey interviews and coded a representative sample of each interview. Foucault (2010) found a significant positive relationship between interviewer smiling and nodding, and respondent-assessed rapport. She also found a significant negative relationship between a direct gaze and respondent-assessed rapport. It seems that higher-rapport interviewers smile and nod more frequently, but look at their respondents less frequently than lower-rapport interviewers. In the context of interviewer training, these findings are more practical than those of Houtkoop-Steenstra (1997), because rapport may be established through particular interviewer nonverbal behaviors without violating the standardized interviewing protocols. However, Foucault (2010) did not examine the effect of these interviewer nonverbal behaviors on the accuracy of reporting. It is unknown whether higher rapport (reflected by the interviewer smiling and nodding more and with fewer gazes directed at the respondent) will elicit more accurate responses from respondents.

### 2.1.2 Rapport and Disclosure of Sensitive Information in Survey Interviews

It seems plausible that the effect of rapport on the disclosure of sensitive information is mediated by the sensitivity of survey questions. Rapport-related verbal behaviors have been found to improve answers to moderately sensitive questions; for example, in the study by van der Zouwen et al. (1991), the respondents gave fewer socially desirable responses when asked about their satisfaction with housing and the neighborhood, and their relationships with neighbors. However, the opposite may be true if highly sensitive questions are asked.

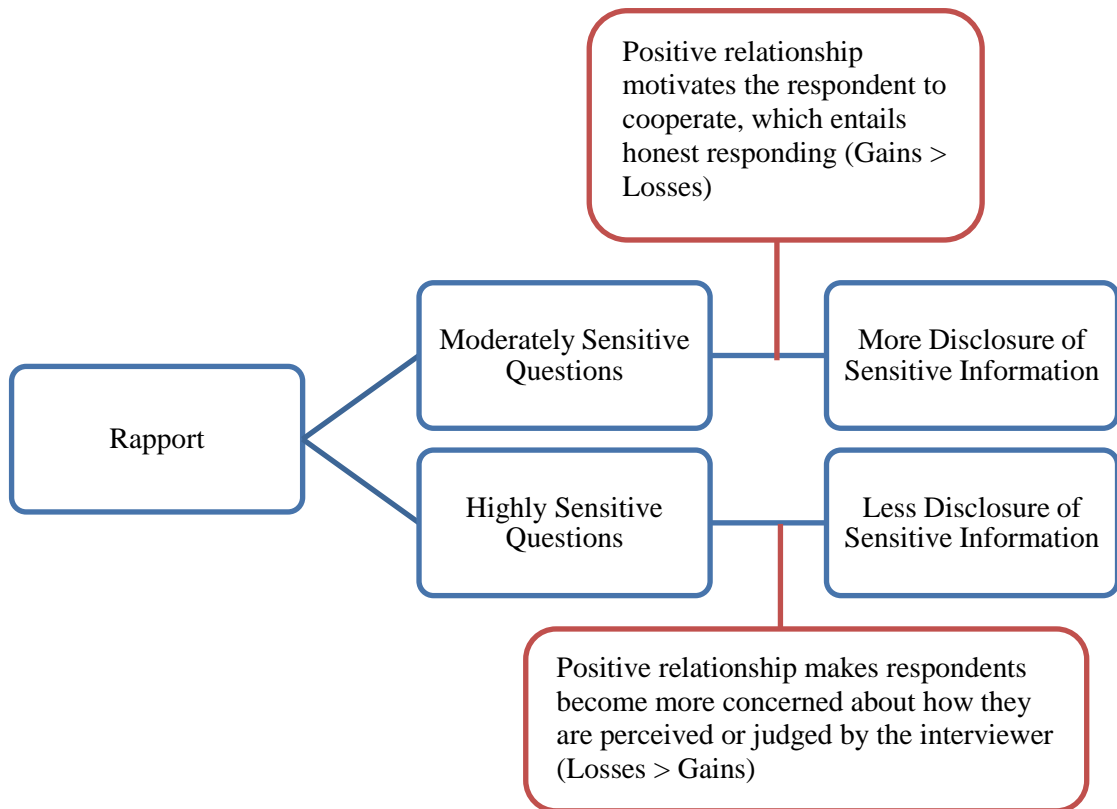
It has been suggested that a survey question is perceived as sensitive if it is intrusive, if it raises fears about the negative consequences of disclosure of the answers to a third party or if it elicits responses that are socially undesirable (Tourangeau & Yan, 2007). Whether to give honest responses or to misreport seems to be an individual decision that involves several concerns (Tourangeau, Rips, & Rasinski, 2000). The Subjective Expected Utility (SEU) theory has been used as a general framework for understanding how these disclosure concerns are weighted and combined in making the decision to report accurately or to misreport. This theory suggests that respondents consider losses and gains in making the decision of whether or not to disclose. When making the decision, respondents might consider losses, such as embarrassment, in admitting involvement in socially undesirable behaviors, or negative consequences from the disclosure of responses to agencies or individuals that are not directly involved in the survey. Also, they might consider gains, such as a positive harmonic relationship with the interviewer or the improvement of knowledge about certain topics (Rasinski, Baldwin, Willis, & Jobe, 1994; Tourangeau et al., 2000).

It seems plausible that, when *moderately* sensitive questions are asked, the greater the respondents' rapport with the interviewer, the more accurately they will answer: Their positive relationship with the interviewer will motivate respondents to invest more effort to be more cooperative. Under these circumstances, the gains from a positive and harmonious relationship with the interviewer outweigh the losses due to downside consequences such as embarrassment. However, it could be a different story for *highly* sensitive questions. As rapport increases, so may socially desirable responses, because respondents are more concerned about the impressions they give to interviewers with whom they have a positive relationship – they really do not want such interviewers to think ill of them – than when their relationship with the interviewer is neutral or negative. Under these circumstances, the respondents become more concerned about how they are perceived or judged by the interviewer, which outweighs the gains of having a “good chemistry” with the interviewer (see Figure 1.1).

This hypothesis is in line with the argument of Cannell and Axelrod (1956). They suggested that the respondent will disclose sensitive information to the interviewer as a means of maintaining a positive relationship with the interviewer. They also argued that there will be a point beyond which the cost for respondents to provide sensitive information is higher than the cost for them to maintain a good relationship with the interviewer, at which time the respondent will either break off, refuse to answer or provide socially desirable responses. In the current study, perceived question sensitivity is used to define the tipping point beyond which the respondents change how they answer. It is hypothesized here that the impact of rapport on disclosure depends on question sensitivity: When questions are moderately



or less sensitive, rapport motivates respondents to provide more honest responses, whereas when questions are highly sensitive, rapport leads to less honest responses.



**Figure 1.1** The hypothesized effect of rapport on the disclosure of sensitive information

### 2.1.3 Measures of Rapport in Survey Interviews

Three different types of self-reported measures are frequently used to assess rapport in survey interviews: interviewer-based, respondent-based and rater-based measures. For instance, Williams (1968) had interviewers answer a personality test (the Guilford-Zimmerman Temperament Survey) designed to capture their rapport- and task-related role-performance characteristics, and then, used those measures to predict response bias. This study found that African American respondents gave fewer conservative responses to race-related questions when interviewed by African

American interviewers who were high in rapport-related characteristics. However, it is unknown if the personality test was conducted during the interviewer training or at the end of the interview. Weiss (1968), in contrast, had interviewers rate respondents, at the end of the interview, on a five-point scale measuring how confiding, frank, equivocal, guarded and hostile the respondents were. She found that respondents who were rated the highest in rapport were the most biased. Henson et al. (1976) and van der Zouwen et al. (1991) both asked respondents to fill out a questionnaire after the interview to evaluate the interviewer and the interview; however, those measures were not used to examine the relationship between respondent-assessed rapport and response accuracy. As a step forward, Foucault (2010) used respondents' nonverbal behaviors to predict their post-test evaluation of interview rapport. Note that it was the respondents' – as opposed to the interviewers' – rating of rapport that was under study in Foucault's study. Rater-based measurement, however, is often used when examining non-verbal correlates of rapport, where raters first watch a random portion of the video-recorded interaction, and then, give an evaluation on some rating scale (e.g., Harrigan, Oxman, & Rosenthal, 1985).

According to Tickle-Degnen and Rosenthal (1990), rapport is an interactive dynamic process of three interrelating components: positivity, mutual attentiveness and coordination. The relative weighting or importance of these components in the experience of rapport changes over the course of an interaction. Positivity and attentiveness are more heavily weighted than coordination in early interactions, whereas coordination and attentiveness are more heavily weighted than positivity in later interactions (Tickle-Degnen & Rosenthal, 1990). This seems to suggest that the rapport ratings given by interactants at the end of the interview are more precise and comprehensive, because they take into account all of the components and their

evolution over time. A rater's evaluation of rapport, in contrast, may be based upon a random portion of the interaction, which may neglect important features of an interaction and cannot capture the dynamic nature of rapport establishment. As DePaulo and Bell (1990, p306) noted, the experience of rapport only belongs to the interactants: "It is their experience of rapport, and only theirs, that is definitional."

If an interaction involves two persons in everyday interactions, the sense of rapport of both persons is likely to affect the interaction; however, this might not be the case in survey interviews. From the perspective of respondents, a survey interview may be a unique or unusual experience. It may be out of the ordinary stream of daily events, so the respondents may bring no expectations to the interaction. They rely on cues given by interviewers to set the tone for the interaction. Because it is an unusual experience, respondents may pay extra attention to what happens during the interaction, and thus, their rapport evaluation at the end of the interview may be more comprehensive. With respect to interviewers, however, survey interviews probably fall into the category of daily events. They have a well-defined goal to bring to the interaction, that is, to obtain information from respondents. When evaluating rapport, interviewers may compare their experience with the current respondent to some prior experience with other respondents, possibly in very different interview situations, in order to judge how much rapport they felt with most recent respondent. In this regard, the interviewer's evaluation of rapport after the interview may not precisely describe what happened during that particular interview.

## *2.2 Video-mediated Interaction versus Face-to-Face Interaction*

With the rapid advancement of technology, more and more means of communication are becoming available and affordable. People are becoming

increasingly adapted to these newer forms of communication, such as mobile instant messaging, social networking (e.g., Twitter and Facebook) and videoconferencing, and they may use them more frequently in everyday life. There is growing interest in the uses and application of video-mediated interaction in fields such as health care (e.g., Miller, Alam, Fraser, & Ferguson, 2008; Sedgwick & Spiers, 2009; Sharp, Kobak, & Osman, 2011), education (e.g., Freeman, 1998; Roberts, 2011; Zerr & Pulcher, 2008) and business (e.g., Baker & Demps, 2011; Chapman & Rowe, 2002). Little attention has been paid, however, to the effect on survey interviews of video-mediated interactions as a potential mode of data collection.

One exception is an exploratory study conducted by Bertrand and Bourdeau (2010), in which they asked graduate students to conduct a Skype interview with a student or faculty member of their choice on the motivation for using alternative transportation methods. A focus group was then used to evaluate the graduate students' impressions of the Skype interview. All of the participants seemed to have an overall positive impression of Skype interviews and showed interest in using them in future research activities.

Despite this overall positive evaluation, this study also revealed some questions that deserve further investigation, such as whether rapport can be similarly established in video-mediated and face-to-face interviews, and whether video-mediated interviews increase the disclosure of moderately sensitive information to the same extent as face-to-face interviews. Although video-mediated interviews could potentially decrease the cost of administering surveys to a great extent, little is known about it as a method of interviewing. The answers to these questions will help survey researchers in thinking through whether to adopt a video-mediated interaction for interviewing. If rapport can be effectively established in video-mediated interviews,

and if respondents disclose at levels similar to video-mediated and face-to-face interviews, this seems to suggest that video-mediated interviewing is a promising mode of data collection and deserves further consideration from survey designers.

### 2.2.1 Communication in Video-mediated Interactions

In any conversation, the speaker and the listener continuously provide each other with evidence of whether they understand each other well enough to ground their utterances (Clark & Brennan, 1991). Clark and Brennan (1991) listed eight constraints that a medium may place on communication between two interactants and that may, therefore, affect their grounding process. According to their argument, face-to-face interviews have the properties of: (1) co-presence—participants share the same physical environment; (2) visibility—participants can see each other; (3) audibility—participants can hear each other; (4) co-temporality—participants interact with each other at the same time; (5) simultaneity—participants can interact with each other simultaneously; and (6) sequentiality—participants interact in turns that follow a known temporal order. Compared to face-to-face interactions, video-mediated interactions have similar properties in all aspects, except for full physical co-presence. This seems to suggest that most of the verbal and non-verbal cues that exist in face-to-face interactions can be communicated in video-mediated interactions, if technical issues— such as restricted views, bandwidth constraints and transmission lags—do not exist, and therefore, similar communication patterns can be expected (Anderson, 2008). However, this argument is not fully supported by previous research.

Sellen (1992) examined patterns of spontaneous speech behaviors between two video-mediated interactions and face-to-face interactions. One video-mediated interaction was similar to desktop videoconferencing with a single camera, monitor

and speaker, during which the interactants saw each other on the computer screen. The other video-mediated interaction used multiple cameras, monitors and speakers to support directional gaze cues and selective listening. The author found that, compared with face-to-face interactions, participants in the two video-mediated interactions were less likely to produce simultaneous speech, and they waited longer for others to finish before attempting to take the conversational floor. In addition, interactants were more likely to use explicit conversational handovers by naming the next speaker, and they more frequently tagged the end of a turn to indicate that they had finished in the video-mediated interactions, than in face-to-face interactions (Sellen, 1995).

O’Conaill, Whittaker, and Wilbur (1993) compared two video-mediated interactions of different quality with face-to-face interactions on various speech behaviors. They found that, compared with face-to-face interactions, interactants in both the low-quality (with half-duplex audio, transmission lags and poor image quality) and high quality (with full-duplex audio, immediate transmission and broadcast-quality video) video-mediated interactions gave fewer backchannels, used explicit handovers more frequently and reduced their floor holding. It seems that people recognize the differences between video-mediated and face-to-face interactions, and therefore, they employ a formal style of interaction with fewer disruptions, longer turns and explicit handovers of the conversational floor.

Olsen and Olsen (1995) compared three modes (remote audio vs. remote video vs. face-to-face) and found that participants spent more time clarifying what they meant to each other and talked longer about how to manage their work in remote groups. Additionally, Doherty-Sneddon et al. (1997) produced video images that were presented as life-size images and used a system that was configured to support direct eye contact over the video link. The authors found that significantly more needed to

be said to complete a problem-solving task in video-mediated interactions than in audio-only interactions. Moreover, van der Kleij, Schraagen, Werkhove, and De Dreu (2009) compared a video-mediated interaction to a face-to-face interaction in a science quiz task. The videoconferencing system they used enabled selective gaze and was without transmission delays. The authors found that participants took fewer turns, required more time for turns and interrupted each other significantly less in video-mediated interactions than in face-to-face interactions. However, the speech differences did not affect task performance. Participants in the two modes were able to maintain comparable performance scores.

It is worth noting that the communicative differences between video-mediated and face-to-face interactions may decrease over time as people get more used to the new technology. van der Kleij et al. (2009) found that as participants gained experience over four sessions of discussion, the initial differences between video-mediated and face-to-face interactions, in turn duration, the number of turns and the number of simultaneous speeches, had disappeared, suggesting that people had adapted to the newness and limitations of their communication environment. The technological adaption effect occurs when people learn how to use the technological tools that are available, despite technological limitations, such as restricted bandwidth or low video-image resolution (Dourish, Adler, Bellotti, & Henderson, 1996; Olson & Olson, 2000; van der Kleij, Paashuis, & Schraagen, 2005). This may apply to survey interviewing as well. As interviewers and respondents become more accustomed to the features of video-mediated interactions, they may become more adapted to this given communication environment, and they may ground their conversations more naturally, as in face-to-face interactions. The communicative differences between video-mediated and face-to-face interviews may diminish over time as interviewers

and respondents gain experience and learn effective practices to adapt to the technologies available to them. Once people become sufficiently familiar with the medium, they may ignore the technological limitations and may ground their conversations more naturally, as in face-to-face interviews.

### 2.2.2 Rapport Establishment in Video-mediated Interactions

No research to date has explored the impact of rapport on survey responses in different modes of data collection. However, the issue of rapport is of particular interest in the field of telepsychiatry, with a growing body of literature looking at the potential impact of video-mediated interactions on the establishment of rapport. Although physician-patient interaction is not the focus of the current study, a brief review of research on rapport in this domain may provide useful information.

Manning, Goetz, and Street (2000) investigated the effect of transmission lag on the self-reported rapport in telepsychiatry sessions for stress evaluation. The prediction was that the signal delay in video would be particularly problematic in establishing rapport, so they compared sessions with three levels of signal delay (zero, 300 ms and 1,000 ms) to face-to-face interactions. The authors did not find significant differences in the self-reported rapport ratings for male participants. Female participants, in contrast, rated rapport significantly lower in face-to-face sessions than in video-mediated sessions. Manning et al. (2000) argued that female participants felt more comfortable interacting with unfamiliar male counselors in distant video-mediated interactions because of the isolation they provided.

Miller and Gibson (2004) examined recordings of the video-mediated interactions of 26 trainee psychologists. They found that trainees interacting with their supervisors via video-mediated interactions felt less equal in power and status,



compared with those in face-to-face interactions. The findings on involvement, however, were inconsistent: 50% of the trainees felt less free to discuss emotional material in video-mediated interactions and preferred to ignore social and emotional issues or discuss them in a face-to-face or telephone meeting, whereas another 28% of the trainees felt freer to discuss emotional material in video-mediated interactions and thought the medium served as a protective barrier.

Simpson, Bell, Knox, and Mitchell (2005) looked at the effect of video therapy on six patients with eating disorders. They found that video therapy is effective in establishing a positive and facilitative therapeutic alliance, which is broadly defined as a collaborative relationship between the patient and the therapist (Horvath & Marx, 1990). In this study, participants reported a number of advantages of video therapy over face-to-face interactions, i.e., they were more comfortable and relaxed, less pressured, less intimidated, less embarrassed, less self-conscious and felt a greater sense of control. It was speculated that video-mediated interactions may provide particular benefits for clients with high levels of shame and body-related self-consciousness. We may consider this analogous to answers including highly sensitive information that surveys are sometimes used to probe, such as illicit drug use.

Bouchard and collaborators (2004) compared the effect of video with face-to-face therapy using 21 patients with eating disorders, and they found no differences between the two modes in patients' perceptions of therapeutic alliance. Likewise, Morgan, Patrick, and Magaletta (2008) found no differences between video-mediated and face-to-face interactions in inmates' perceptions of therapeutic alliance. Morland et al. (2010), however, found that patients in face-to-face interactions gave significantly higher overall scores of therapeutic alliance than those in video-mediated interactions.

Inconsistent results have been found in the arena of telepsychiatry for several reasons. In much of the literature, the sample size was small; for example, the sample size was 26 in both Miller and Gibson (2004) and Simpson et al. (2005). Different methodologies were used across the studies as well; for instance, Miller and Gibson (2004) used qualitative content analysis, whereas Morland et al. (2010) used clinical trials. Additionally, the measure of patient satisfaction is inconsistent between studies; for example, patient satisfaction was assessed by whether the patient would use the video therapy again, as well as whether the patient was satisfied with the service received. The inconsistency may also be related to participants' prior experiences with video-mediated interactions. If patients are uncomfortable with the technology, this may influence their satisfaction, as well as their therapy outcomes, regardless of how they felt about the therapist. Despite all of the differences, the prior research seems to suggest that a fair amount of rapport can be successfully established in telepsychiatry.

One often mentioned advantage of telepsychiatry is the social distance it provides (e.g., Hilty, Marks, Urness, Yellowlees, & Nesbitt, 2004; Manning et al. 2000; Miller & Gibson, 2004). It seems that people are more comfortable revealing their emotional or social problems in a mediated, i.e., distant, interaction. In the context of survey interviews, this seems to suggest that the social distance created by video-mediated interviews is particularly beneficial when asking for highly sensitive information. Video-mediated interactions may give people more control over the interaction; for example, they can break off by closing the video window whenever they feel it is necessary. In addition, if respondents think the interviewer is in a remote location, they may become less concerned about how they are judged by interviewer, and therefore, they may disclose more.

Survey interviews are a quite unusual form of interaction when compared with other kinds of conversations, including psychiatric therapy. First, the goal is different in the two kinds of interactions. The primary task of interviewers is to obtain data from respondents on behalf of research designers, whereas the goal of therapists is to provide care for patients in need of psychosocial intervention. Second, the roles of the two parties are different in the two kinds of interactions. In interviewer-administered surveys, interviewers follow a script of questions and probes written by research designers. Their role is more that of a passive information gatherer, in contrast to therapists, who obtain, as well as actively provide, information to patients. They are heavily involved in the interaction, pay great attention to the patient and are highly responsive to the patient's prior conversation. Additionally, the degree of connection between the two parties in the interaction is different. Interviewers are usually instructed to be polite to respondents in order to facilitate data collection. Therapists, in contrast, need to form a strong positive emotional bond with patients in order to maximize the benefit of the treatment outcome. A relationship that features acceptance, positive regard and empathy is essential for successful psychotherapy (e.g., Wright & Davis, 1994). In this regard, if rapport can be established in video-mediated psychotherapy, which requires patients to disclose the most sensitive and personal information, it seems plausible that a sense of rapport can also be established between the interviewer and the respondent in a video-mediated interview in which the disclosure is not generally as extreme.

Although rapport can apparently be established in video-mediated psychotherapy sessions, the level of rapport in these interactions may not exceed that in face-to-face interactions. A direct gaze was found to increase attention and receptivity in physician-patient interactions (Robinson, 2006). Foucault (2010) found

that high-rapport interviewers were less likely to gaze directly at respondents. However, she also found that high-rapport interviews exhibit a substantial number of direct gazes, with direct gazes occurring during one-third of the utterances, although low rapport interviews have even more direct gazes. The study suggested that moderate amounts of direct gazes –not too many or too few—may contribute to rapport when it is at its highest. However, direct eye contact with one another is usually not supported in most of the current videoconferencing systems. Usually, the built-in camera is placed on the top of the computer monitor. If a separate camera is used, it is usually placed either on the top or to the side of the computer, but never in front of the monitor. Under these circumstances, in order to have direct eye contact, the two interactants must look directly at the camera, which is quite unnatural and rarely occurs. This seems to suggest that the lack of direct eye contact due to technical limitations makes rapport establishment much more difficult in video-mediated interactions. In addition, the lack of eye contact is found to be associated with lower levels of trust perceptions (Bekkering & Shim, 2006). It was also found that higher levels of trust occur with greater amounts of self-disclosure (e.g., Wheelless & Grotz, 1977). Therefore, in the context of survey interviews, it seems plausible that the respondent will disclose *less* sensitive information in video-mediated interviews than in face-to-face interviews.

Even if direct gazes are supported in video-mediated interactions, participants do not seem to behave as naturally as they do in face-to-face interactions. Doherty-Sneddon et al. (1997) explored participants' performances in a problem-solving task with a videoconferencing system that produces life-size video images and supports direct eye contact. They found that participants looked at one another far more often than they did in face-to-face interactions. The authors speculated that participants may

have become distracted by this atypically realistic video setup. The unfamiliarity of the medium seems to make it difficult to maintain an optimal level of direct gaze—not too much or too little—with one another in video-mediated interactions, which negatively affects the establishment of rapport. As was hypothesized in Section 2.1.2, lower rapport will elicit fewer disclosures of moderately sensitive information. Therefore, it seems plausible that the respondent will disclose *less* sensitive information in video-mediated interviews than in face-to-face interviews. It is worth noting, however, that this condition may change once interviewers and respondents become more adapted to the newness of the technology and to technological limitations.

### 2.2.3 Disclosure of Sensitive Information in Video-mediated Interactions

Hancock, Thom-Santelli, and Ritchie (2004) argued that there are at least three features of the communication environment that affect deceptive language use, including recordability, synchronicity and physical co-presence. The first feature is the degree to which the interaction in a medium is recordable. The more recordable the medium is, the less likely a person should be willing to lie (Hancock, 2008; Hancock et al., 2004). The second feature represents the degree to which messages are exchanged in real time. The last feature is whether the speaker and the listener are in the same physical space (Hancock, 2008).

Face-to-face and video-mediated interviews share the first two features, but differ with respect to the last one. Both face-to-face and video-mediated interviews are recordable. For example, CAPI interviews can be recorded with a Computer Audio Recorded Interviewing (CARI) system (Mitchell, Fahrney, & Strobl, 2009). If participants believe an interaction is being recorded, they may become more hesitant

to lie, because the entire interaction is easily reviewable. Because they are mediated, video-mediated interviews seem easier to record than face-to-face interviews (even if neither is actually recorded), which may be enough to encourage people to be honest. In addition, both face-to-face and video-mediated interviews happen in real time, so there are no differences lying across the two modes due to any differences in synchronicity.

Face-to-face and video-mediated interviews, however, differ on the feature of co-presence. In face-to-face interviews, the interviewer and the respondent share the same physical location, which makes it impossible to lie about things such as whether a third party is present, whether the respondent smokes cigarettes or whether the respondent is overweight. However, the interviewer and the respondent in a video-mediated interview are usually at different geographical locations, which makes lying possible to a certain degree. For example, because only the image of the upper body is usually given in the video window, respondents can easily lie about their BMI by providing socially desirable responses, and this may, more generally, give respondents a sense of cover. Taking all three features into account, this seems to suggest that respondents may provide *more* socially desirable responses in video-mediated interviews.

## *2.3 Effect of Interviewer Presence on the Disclosure of Sensitive Information*

### *2.3.1 Physical Presence of Interviewer*

The literature on the reporting of sensitive information suggests that the interviewer is a contributor to measurement error (e.g., Tourangeau & Yan, 2007). Respondents tend to report less sensitive information in interviewer-administered interviews than in self-administered interviews. The underlying mechanism could be

that the respondent is afraid of embarrassment or losing face through reporting sensitive information to the interviewer. However, the physical presence of the interviewer does not seem to have much effect on responses if the interviewer is not aware of what the respondent is reporting; for example, with Audio Computer-Assisted Self-Interviewing (ACASI), the interviewer is unaware of the answers, but is physically present, which is presumably part of the reason for increased disclosure in this mode (e.g., Tourangeau & Smith, 1996).

This is the case for face-to-face interviews, but not for telephone interviews. In telephone interviews, the interviewer is not physically present, but is aware of answers that the respondent provides. de Leeuw and van der Zouwen (1988) conducted a meta-analysis of telephone – face-to-face comparisons and found that, in telephone interviews – in which interviewers are aware of answers and are co-present auditorily – telephone respondents are less candid when reporting sensitive information than respondents in face-to-face interviews. Likewise, Holbrook et al. (2003) found that people in telephone interviews were more likely to give socially desirable responses compared to people in face-to-face interviews. This seems to suggest that face-to-face interviews promote the establishment of rapport, which then motivates people to cooperate and to be more honest, whereas telephone interviews are less effective at building rapport.

### 2.3.2 Social Presence of Interviewer

Social presence is defined as “the salience of the other in a mediated communication and the consequent salience of their interpersonal interactions” (Short, Williams, & Christie, 1976, p. 65). It is “the capacity of a medium to transmit information about facial expression, direction of looking, posture, dress and non-

verbal cues” (Short et al., 1976, p. 65). Media can be classified along a continuum according to its levels of social presence, with face-to-face communication producing the greatest social presence, followed by audio plus video (e.g., videoconferences), audio-only (e.g., telephone interviews) and print (e.g., paper-and-pencil questionnaires) (Short et al., 1976). The theory of social presence suggests that the more nonverbal cues people experience in a medium, the more social presence they experience, which leads to a warm, friendly and satisfied interaction most of the time (Walther, 2011).

It seems plausible that the humanizing cues of an interface may create an illusion of presence, and therefore, may have an impact on a respondent’s answers that is similar to a face-to-face or telephone interview. In the area of Human-Computer Interaction (HCI), research suggests that people tend to treat computer interfaces as social actors, rather than as inanimate devices, and that people tend to apply the rules of human-human interactions to human-computer interactions (e.g., Nass, Fogg, & Moon, 1996; Reeves & Nass, 1996; Sproull, Subramam, Kiesler, Walker, & Waters, 1996; Walker, Sproull, & Subramani, 1994). It seems that people orient to computers as social actors and humanizing cues in a computer interface can elicit responses from users that are similar to those in interactions between humans.

In particular, several studies have examined the effect of the voice of an interface on responses with either laboratory experiments or survey studies. Nass, Moon, and Green (1997) tested whether the gender of the voice of a computer interface would evoke gender-based stereotypic responses using a small-scale laboratory experiment varying subject gender, tutor voice (male vs. female), evaluator voice (male vs. female) and topics. They found that respondents tended to give gender-stereotypic responses. In addition, they found significant two-way interaction



between the topic and the gender of the tutor voice. Respondents perceived the male-voiced tutor computer to be more informative about “masculine” topics (e.g., computer) and the female-voiced tutor computer to be more informative about “feminine” topics (e.g., relationships). It seems that the tendency to gender stereotype is very strong and can extend even to machines.

In their second experiment, Nass, Moon, and Carney (1999) used two different male voices. Respondents were randomly assigned to one of the three conditions: (1) interviews were conducted by the same computer with the same voice that the subject worked with during the task; (2) interviews were conducted by a different computer with a different voice; and (3) a paper-and-pencil questionnaire. They found that same-computer subjects responded more positively and less honestly than paper-and-pencil subjects. This study did not examine the effect of voice on responses separately from that of the same or a different computer.

Lee, Nass, and Brave (2000) varied the text-to-speech gender and the gender of the participant to examine if, and how, the gender of the speech interface affected the user’s perception of the computer and their conformity to the computer’s recommendation. They found that participants assigned more “masculine” attributes to the male-voiced computer and tended to accept the male-voiced computer’s suggestions. They also found that participants perceived voices in their own gender as more attractive than those in the opposite gender.

In addition, Nass, Robles, Heenan, Bienstock, and Treinen (2003) conducted a ten-condition field experiment varying presentation modality (text vs. recorded speech vs. synthetic speech), participant gender and speech gender. They found that synthetic speech participants were less comfortable and disclosed less to the computer

system relative to text-based or recorded-speech participants. They also found that female voice participants were less comfortable with the disclosure questions than male voice participants.

In the survey field, two studies have investigated the effect of voice in a survey interface on responses. Couper, Singer, and Tourangeau (2004) conducted a field experiment that varied voice types (live interviewers vs. recorded human voices vs. human-like text-to-speech systems vs. machine-like text-to-speech systems) and the gender of the voice (male vs. female) in an IVR survey. They found no differences in the disclosure of sensitive information across the three types of IVR voices. They also found that the gender of the interviewer or IVR voice has no effect on the answers given to sensitive questions.

Dykema, Diloreto, White, and Schaeffer (2012) examined the effect of the gender of the voice used in the ACASI audio-file on sensitive disclosures in a sample of young adults at high risk for engaging in socially undesirable behaviors, such as lying to parents and shooting someone. They found higher levels of sensitive disclosure and more consistent reporting among male respondents when a female voice was used in the ACASI. The reports of female respondents, however, were not affected by the gender of the voice.

It is puzzling why such a strong effect of voice has been found in social interface work, but has not consistently been found in the survey field. One element that is worthy of attention is that the settings of these two areas are quite different. In the survey response tasks, respondents have an incentive to disregard the humanizing cues: They are being asked to disclose sensitive information. This may cause respondents to turn off the mechanism that produces the feeling of social presence,

and instead, to primarily notice the absence of a human interviewer. Laboratory subjects do not have this motivation, and, in the lab, the experimenters set up situations that maximize the chances of a social presence effect. In addition, surveys are tightly scripted, whereas many of the prior HCI experiments involved unscripted interactions. Orienting to a computer as a social actor is believed to be a very unconscious response by HCI researchers, while responding to a survey is a very conscious process. It may be that the social cues are dampened when the script is rigid and most of the interaction is processed consciously.

#### *2.4 Summary of the Literature*

Although there is no universally accepted way to define and operationalize rapport, the general consensus is that it can have an impact on survey responses (e.g., Foucault, 2010; Lavin & Maynard, 2001), potentially affecting their quality. With a personal interviewing style, rapport-related verbal behaviors were found to increase the disclosure of sensitive information (e.g., Dijkstra, 1987). With standardized interviewing, the respondent's sense of rapport was found to be greater when the interviewer smiled and nodded more often and when the interviewer gazed directly at the respondent less often (Foucault, 2010). To date, however, little is known about the effects of rapport on data quality in standardized interviewing. For example, it is unknown whether interviews with high rapport will illicit more or less honest responses from respondents, and whether the effects of rapport on disclosure will vary based upon the sensitivity of the survey questions.

According to the Subjective Expected Utility (SEU) theory, people consider losses and gains when making the decision about whether or not to disclose. It seems plausible that the effect of rapport on the disclosure of sensitive information is

mediated by the sensitivity of the survey questions. When survey questions are moderately sensitive, rapport motivates the respondent to provide more honest responses because the gains of maintaining a good relationship with the interviewer outweigh the loss of embarrassment, whereas when questions are highly sensitive, rapport leads to less honest responses, because the possibility of losing face outweighs the gains of feeling “good chemistry” with the interviewer.

Moderately sensitive information is often asked in the interviewer-administered mode of data collection. In video-mediated interviews, the interviewer and the respondent can see and talk to each other via a video window. It seems that most of the verbal and non-verbal cues that exist in face-to-face interactions can be communicated in video-mediated interactions if technical issues—such as restricted views, bandwidth constraints and transmission lags—do not exist, and therefore, similar communication patterns can be expected (Anderson, 2008). However, this argument is not fully supported by previous research. People tend to employ a more formal style of interaction in video-mediated interactions than in face-to-face interactions, with fewer disruptions, long turns and explicit handovers of the conversational floor. It is, of course, possible that interview participants may attend more fully to each other’s visual, nonverbal behaviors as they gain experience with video-mediated interviews.

As far as rapport is concerned, it seems plausible that a sense of rapport can also be established between the interviewer and the respondent in a video-mediated interview. However, the level of rapport in video-mediated interviews may well be lower than that in face-to-face interviews, as fewer cues are available in remote communication. Because rapport is difficult to establish, respondents are more likely

to give fewer disclosures of moderately sensitive information in video-mediated interactions than in face-to-face interactions.

Highly sensitive information is usually obtained via self-administered modes of data collection. The physical presence of the interviewer does not seem to have much effect on the responses if the interviewer is unaware of the respondent's answers, such as in ACASI. The literature on Human-Computer Interaction (HCI) suggests that people orient to computers as social actors. According to studies of HCI, the voice used in an interface can have a strong effect on people's perceptions and responses. However, inconsistent findings were found in survey research.

## Chapter 3 Hypotheses

### *3.1 CAPI vs. Video-Mediated Interviews on Rapport Evaluation and Disclosure of Moderately Sensitive Information*

Technological advances in recent years have made video-mediated interviews more feasible and affordable; however, little attention has been paid to videoconferencing as a potential mode of data collection in survey interviews. In video-mediated interviews, the interviewer and the respondent can see and talk to each other via a video window. Video-mediated interviews provide several potential advantages for surveys. Respondents in video-mediated interviews may feel more engaged or connected than those in telephone interactions due to a greater sense of social presence. This may lead to higher completion rates and better data quality. They are a cost-saving alternative to in-person interviews, especially when interviewing geographically dispersed respondents. Additionally, there may be certain types of questions that especially benefit from the social distance provided by video-mediated interviews, as opposed to face-to-face interactions. However, so far, these hypotheses have not been tested empirically.

Although rapport-related verbal behaviors have been found to increase the disclosure of moderately sensitive information in face-to-face interactions (van der Zouwen et al., 1991), it is unknown if rapport can be established to the same extent in video-mediated interviews, leading to similar levels of disclosure. We compare video-mediated interviews with face-to-face interviews in a laboratory experiment to investigate (1) whether rapport can be similarly established in video-mediated and computer-assisted personal interviews (CAPI); and (2) whether video-mediated

interviews increase disclosures of moderately sensitive information to the same extent as CAPI.

Based on the literature on rapport and video-mediated interactions, we derived the following two hypotheses:

- Rapport will be lower in video-mediated interviews than in CAPI.
- Compared with those in CAPI, respondents in video-mediated interviews will give fewer disclosures of moderately sensitive information.

Compared with CAPI, video-mediated interactions are relatively low in social presence because fewer visual cues are available (Anderson, 2008). While potentially a shortcoming for video interviewing, this can also offer some advantages when asking for highly sensitive information. People seem to be more comfortable revealing their emotional or social problems in a mediated distant interaction. In the context of survey interviews, this seems to suggest that the social distance created by video-mediated interviews is particularly beneficial when asking for highly sensitive information. Video-mediated interviews may give respondents more control over the interaction. In addition, respondents may become less concerned about the interviewer's perceptions or judgments about themselves in video-mediated interactions.

However, this could be a different story when moderately sensitive information is requested. Rapport is hypothesized to improve the reporting of moderately sensitive information, because the gains of establishing and maintaining a good relationship with the interviewer outweigh the loss of embarrassment due to admitting involvement in socially undesirable behaviors. Video-mediated interactions usually are not able to provide as much of a sense of social presence as face-to-face

interactions. Accordingly, this negatively affects the establishment of rapport. A moderate amount of direct gaze—not too much or too little—may produce the greatest amount of rapport (Foucault, 2010). Direct eye contact with one another, however, is usually not supported in most current video-mediated interactions, which makes the establishment of rapport much more difficult in video-mediated interactions than in face-to-face interactions. In addition, the lack of eye contact has been found to be associated with lower levels of trust perceptions (Bekkering & Shim, 2006). It also has been found that higher levels of trust occur with greater amounts of self-disclosure (e.g., Wheelless & Grotz, 1977). Therefore, in the context of survey interviews, it seems plausible that the respondent will disclose *less* sensitive information in video-mediated interviews than in face-to-face interviews.

Even if direct eye contact with one another is supported, video-mediated interactions do not necessarily produce an experience that is equivalent to face-to-face interactions (Doherty-Sneddon et al., 1997). The relative unfamiliarity of the medium makes people more distracted, and they look at one another far more often than they do during face-to-face interactions, which also negatively affects the establishment of rapport.

Additionally, compared with CAPI, the interviewer and the respondent are not fully co-present in video-mediated interviews, which makes it easier to lie in this communication environment. However, this also depends on the sensitivity of the survey questions. When highly sensitive information is requested, being at a different geographical location than the interviewer may provide the respondent with the extra comfort necessary for disclosure.



### *3.2 Influence of Prior Respondent-Interviewer Interactions on Sensitive Disclosure in ACASI*

Audio computer-assisted self-interviewing (ACASI) is one of the best methods for collecting information about sensitive topics such as illicit drug use or sexual behavior. In an ACASI interview, respondents read questions on a computer screen and simultaneously hear the text of the questions read to them through headphones. Many studies have found that ACASI increases sensitive disclosures relative to other methods, such as computer-assisted personal interviewing (CAPI) and paper-and-pencil self-administered questionnaires (e.g., O'Reilly, Hubbard, Lessler, Biemer, & Turner, 1994; Tourangeau & Smith, 1996; Turner, Ku, Rogers, Lindberg, Pleck, & Sonenstein, 1998). According to conventional thinking, ACASI is taken as an independent mode of data collection, i.e., the CAPI interaction that almost always precedes it is rarely considered when assessing its impact on disclosure. However, none of the existing research has investigated the possibility that the interviewer-respondent interaction in the prior CAPI module may affect disclosure in ACASI. The prior interviewer-respondent interaction may create a sufficient amount of social presence to reduce sensitive disclosures in ACASI. The respondent may have built a positive relationship or rapport with the interviewer during their prior interaction. Additionally, if the voice used in the ACASI audio-file sounds similar to the CAPI interviewer, it may work as a reminder of the presence of the interviewer. It is plausible that more social presence, created in the preceding module (CAPI or video-mediated interviews), may lead to fewer sensitive disclosures in the ACASI module.

We test this carryover effect with a laboratory experiment to see whether the interaction between the interviewer and the respondent in the preceding module

(CAPI or video-mediated interviews) has an effect on the reporting of sensitive information in a subsequent ACASI module. Specifically, we derived the following hypotheses:

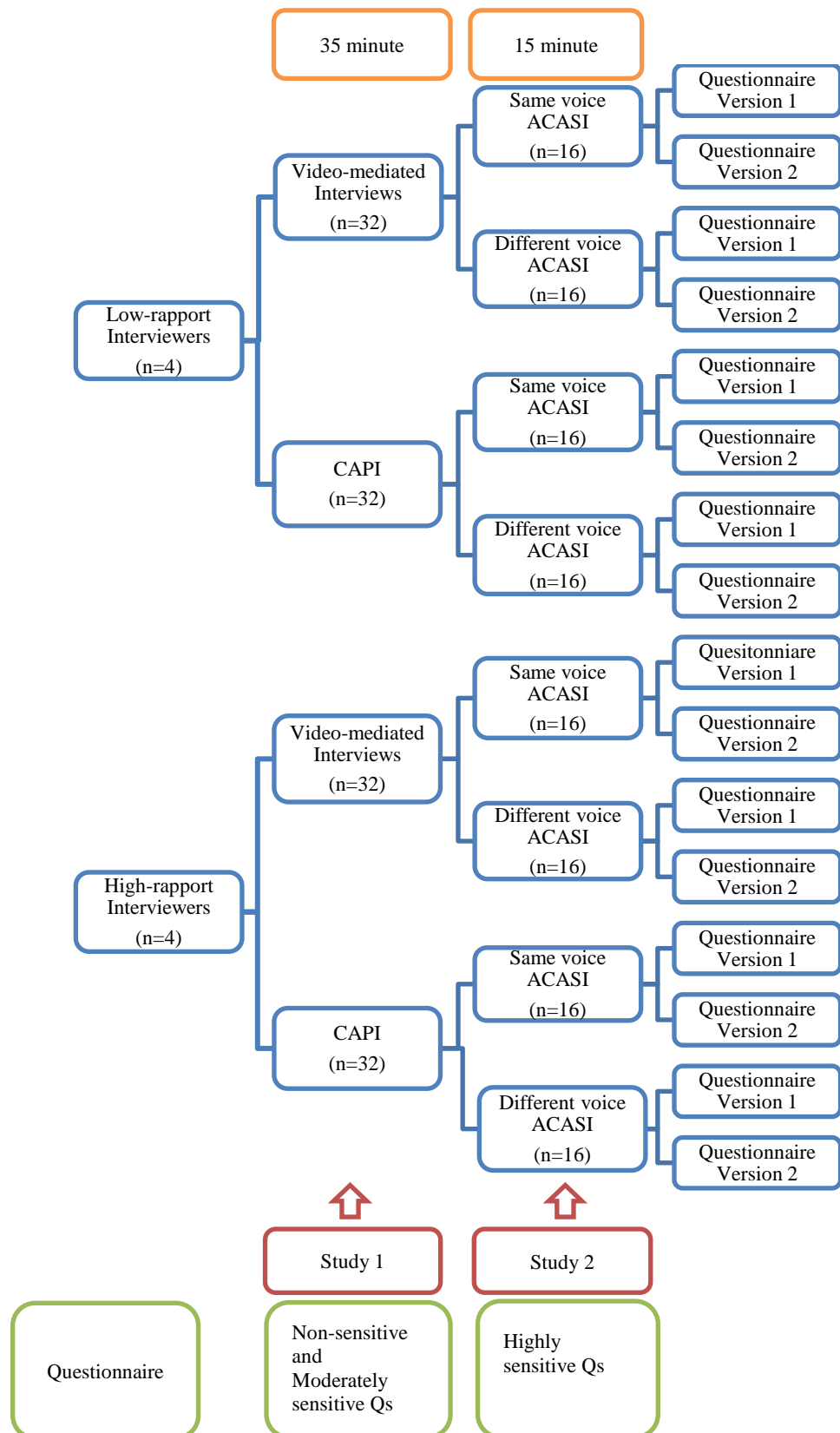
- When the ACASI voice is very similar to the interviewer's voice in the CAPI/video-mediated interview, respondents will disclose less highly sensitive information than their counterparts for whom the two voices are more distinct.
- When the ACASI voice is more similar to the interviewer's voice in the CAPI/video-mediated interview, respondents who experienced high rapport in the preceding module will disclose less than their counterparts who experienced low rapport in the preceding module.
- When the ACASI voice is clearly different from the interviewer's voice in the CAPI/video-mediated interview, rapport in that interview will not affect disclosure.

If the voice used in the ACASI sounds similar to the interviewer in the prior interaction (CAPI or video-mediated interview), this may increase the social presence that the respondent experiences in the ACASI interview rendering it similar to a telephone interview in which respondents report their answers to the interviewer directly. This may reduce the advantages of ACASI as a mode of self-administration.

When highly sensitive questions are asked, it seems plausible that the respondent will disclose less in order to maintain a positive self-image in front of the interviewer with whom a positive relationship or rapport has been established. If the respondent experiences high rapport with the interviewer in the prior interview, the use of a voice that sounds similar to the interviewer in the ACASI may remind the

respondent of the presence of the interviewer, resulting in reduced disclosures of highly sensitive information in ACASI. In addition, if respondents experience high rapport in the prior interview, they may feel most private when the voice used in the ACASI module sounds different from the interviewer's voice in the CAPI module. If the respondent experiences low rapport with the interviewer in the prior interview, however, the manipulation of the voice in the ACASI may not have much effect on survey responses.

A laboratory experiment was carried out to test these two sets of hypotheses (see Figure 1.2). The details of the study design and procedures are given in the next chapter: Data and Methods.



**Figure 1.2** Flowchart shows the experimental conditions, procedure and components of the questionnaire for the laboratory experiment

## Chapter 4 Data and Methods

### *4.1 Accessing the Sensitivity of Survey Questions with Amazon Mechanical Turk*

#### *Workers*

Non-sensitive and moderately sensitive information is usually requested in interviewer-administered modes of data collection, such as CAPI, whereas highly sensitive information is often requested in self-administered modes of data collection, such as ACASI. I expect that the impact of rapport on disclosure depends on the question of sensitivity: When questions are moderately or less sensitive, rapport motivates respondents to provide more honest responses, whereas when questions are highly sensitive, rapport leads to less honest responses (see Section 2.1.2). In order to organize the questionnaire by question sensitivity, so that non-sensitive and moderately sensitive questions are used in CAPI/video-mediated interviews, while highly sensitive questions are used in ACASI, I recruited raters from the Amazon Mechanical Turk to access the sensitivity of survey questions.

#### 4.1.1 Background

It is well known that respondents are more willing to report sensitive information when the questions are self-administered than when they are interviewer-administered. Self-administration has been found to increase the reporting of socially undesirable behaviors, such as illicit drug use (e.g., Aquilino, 1994; Corkrey & Parkinson, 2002; Schober, Caces, Pergamit, & Branden, 1992), abortion (Lessler & O'Reilly, 1997), and mental health symptoms (e.g., Richman, Kiesler, Weisband, & Drasgow, 1999). It also reduces the reporting of socially desirable behaviors, such as attendance at religious services (e.g., Presser & Stinson, 1998). In addition, self-administration improves the reporting of sexual behaviors (e.g., Tourangeau & Smith,

1996). It reduces the discrepancy in the reporting of opposite-sex sexual partners between male and female respondents.

Different methods have been used by researchers to assess the sensitivity of survey questions. For instance, Sudman and Bradburn (1979) asked respondents to identify the questions that they felt were too personal, as well as topics that they thought would make most people very uneasy, moderately uneasy, slightly uneasy or not at all uneasy. Couper, Singer, Conrad, and Groves (2008) asked respondents to rate how much they would mind if different groups of people found out their identities and their answers to the survey questions, such as family members, employers and law enforcement agencies. Kreuter, Presser, and Tourangeau (2008) assessed question sensitivity by asking respondents if a question might make people they know falsely report or exaggerate their answers. In order to control for question sensitivity, so that highly sensitive, rather than moderately sensitive, questions would be used in the self-administered portion of the study, a survey was carried out with Amazon Mechanical Turk workers to assess the sensitivity of survey questions.

Amazon Mechanical Turk (MTurk) is a crowdsourcing Internet marketplace that coordinates tasks that human intelligence is required to complete, such as transcribing audio recordings into text and tagging images (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010). Requestors post Human Intelligence Tasks (HITs) on MTurk to recruit workers. Workers typically receive a small monetary award (e.g., \$0.50 for a 10-minute task). As a method of respondent recruitment, Antoun, Zhang, Conrad, and Schober (2013) compared Amazon Mechanical Turk to three other online sources (Craigslist, Facebook, and Google Ads) and found that the “pull-in” method (online users actively looking for paid work, e.g., MTurk and Craigslist) is more cost efficient than the “push-out” approach (recruiting

online users via ads for unrelated online activities, e.g., Google Ads and Facebook). The “pull-in” method also brought in participants who seemed more committed to the task and more willing to disclose their demographic information than respondents of the “push-out” method. Likewise, Murphy, Keating, and Edgar (2013) found that MTurk workers provided more relevant information and showed more accurate comprehension when answering open-ended cognitive interviewing questions, as well as follow-up questions (e.g., “Since the first of May have you or any member of your household purchased any swimsuits or warm-up or ski suits?”; and probe question, “What type of items did you think of when you heard the question?”). MTurk workers seem to be younger and less affluent than their counterparts in the general populations. Despite the demographic differences, MTurk is a quite cost efficient method of data collection with rapid turnaround. In this study, we recruited 100 MTurk workers to access the sensitivity of survey questions.

#### 4.1.2 Study Design

Fifty-two male and 52 female American native English speakers aged 18 and older were recruited from Amazon Mechanical Turk to participate in a 10-minute Web survey to access the sensitivity of survey questions. The MTurk workers were required to have a HIT approval rate greater than or equal to 85% and to be located in the United States in order to participate. The description of the HITs was worded as follows:

We’d like your help evaluating how people might react to several possible survey questions. We are not asking you to answer the questions but want you to give us your thoughts about the questions.

The procedure involves filling out an online survey that will take approximately ten minutes.

In the survey, you will be asked to evaluate to what extent you think that several possible survey questions might make people you know falsely report or exaggerate their answers on a five-point scale (extremely unlikely, somewhat unlikely, neither unlikely or likely, somewhat likely, or extremely likely), following by a few questions about your demographic information.

Select the link below to complete the survey. At the end of the survey, you will receive a code to paste into the box below to receive credit for taking our survey.

A link to the Web survey was provided after the description. The Web survey was programmed with Qualtrics. Qualtrics is an online questionnaire development platform that facilitates online data collection. Qualified MTurk workers who were interested in the HITs would click the link to enter the Qualtrics Web survey. Upon the completion of the Web survey, the MTurk worker would receive a randomly generated code to receive the monetary award from MTurk. It was a self-selected sample. Similar to the findings of Antoun et al. (2013) and Murphy et al. (2013), the MTurk workers seem to be younger and primarily white.

A total of 190 questions were tested with MTurk workers. Questions on various topics were used, such as dietary behaviors, mental health, alcohol use and sexual behaviors. All of the questions were adapted from existing national surveys, such as NSFG (National Survey of Family Growth), NHANES (National Health and Nutrition Examination Survey) and NSDUH (National Survey on Drug Use and Health). Each self-selected MTurk worker was assigned a random sample of 20 to 25 questions to assess the sensitivity of these questions. MTurk workers were asked to rate each question on a five-point Likert scale, and the wording of the evaluation



question was “To what extent would you say that this question might make people you know falsely report or exaggerate their answer?” (1=Extremely unlikely; 2=Somewhat unlikely; 3=Neither unlikely nor likely; 4=Somewhat likely; and 5=Extremely likely). On each page of the Web survey, the question to be assessed was presented first, followed by the evaluation question.

#### 4.1.3 Results

Each of the 190 questions was rated 10 to 13 times by MTurk workers. Then, a mean sensitivity rating was generated for each question. Based upon the mean ratings, we divided all of the questions into three categories: non-sensitive, moderately sensitive and highly sensitive items. Non-sensitive and moderately sensitive questions are usually used in interviewer-administered modes of data collection, such as CAPI, whereas highly sensitive questions are often asked in self-administered modes of data collection, such as ACASI. Questions with a mean rating of less than 3.0 were categorized as non-sensitive, for instance, “In the past 12 months, did you eat at a restaurant with waiter or waitress service,” and “Have you used or taken any vitamins, minerals, herbals or other dietary supplements in the past 30 days? Include prescription and non-prescription supplements.” Questions with a mean rating between 3.0 and 3.5 were categorized as moderately sensitive, for instance, “Think about the first time you had a drink of an alcoholic beverage. How old were you the first time you had a drink of an alcoholic beverage? Please do not include any time when you only had a sip or two from a drink,” and “Have you ever, even once, used any pain relievers that were not prescribed for you or that you took only for the experience or feeling it caused?” Questions with a mean rating equal to or larger than 3.5 were categorized as highly sensitive, for instance, “When, if ever, was the last occasion you masturbated? That is, aroused yourself sexually?” and “During the past

12 months, have you driven a vehicle while you were under the influence of alcohol.”

One hundred and six questions were rated as non-sensitive, with a mean rating of 2.15.

Thirty-eight questions were rated as moderately sensitive, with a mean rating of 3.28.

Forty-six questions were rated as highly sensitive, with a mean rating of 3.77.

**Table 4.1** Question categorizations based on mean ratings of the sensitivity of survey questions

	<b>N</b>	<b>Mean Sensitivity Rating</b>	<b>SE</b>
Non-sensitive questions	106	2.15	0.05
Moderately sensitive questions	38	3.28	0.02
Highly sensitive questions	46	3.77	0.03

Because the CAPI interview was 35 minutes and the ACASI interview was 15 minutes, not all of the 190 questions from the sensitivity study were used in the main laboratory experiment. The wording of the questions used in the main study, their mean sensitivity ratings and the standard errors are given in Appendix A.

#### *4.2 Interviewer Selection, Training and Screening*

##### *4.2.1. Interviewer Selection and Training*

We recruited 12 female telephone interviewers from the Survey Services Laboratory (SSL) in the Survey Research Center at the University of Michigan. In order to prepare for the voice manipulation in the ACASI study, the interviewer selection was based upon the interviewers’ pitches after controlling for interviewing experiences. In order to facilitate the creation of different female voices that would be used in the ACASI study, we first created a pool of female telephone interviewers whose pitch information was obtained from a prior study. Next, we controlled for their interviewing experiences. Only interviewers who had at least a year and a half of experience in administering surveys were included in the pool. We recruited 12 interviewers with either high or low pitch voices from that pool. The 12 recruited

interviewers were all professionally trained and were considered to be highly experienced SSL interviewers. Most of them were from the Quality Control group or had played the role of Team Leader for various survey projects.

A training session that aimed at standardized interviewing performance was given to the 12 interviewers. For example, the interviewer was instructed to read the questions and probes as worded, to probe neutrally and to repeat the question when the respondent asked for clarification. After the training, a screening procedure was conducted to select four high-rapport and four low-rapport interviewers from the 12 female interviewers. Interviewers were told that the purpose of the study was to improve the understanding of the health and social lives of Michigan employees. Also, they were told that different modes of data collection would be used. The methodological purposes of the study were not communicated to the interviewers so that they would behave naturally during the experiment. Interviewers were debriefed at the end of the main laboratory experiment.

A second interviewer training was given to the four high and four low rapport interviewers that were selected from the screening (see next section). The main purpose of the training was to give the interviewers instructions regarding how to operate the video-mediated interviewing system and to practice with the system. Adobe Connect (<http://www.adobe.com/products/adobeconnect.html>) was used as the video-mediated interviewing system. Adobe Connect is a videoconferencing system that is similar to Skype and Google Hangouts, but provides sharper images with higher resolution. It displays two video images—one of the interviewer and the other of the respondent—on the screen, side-by-side, with the same window size, which may facilitate communicating nonverbal cues.

## 4.2.2 Interviewer Screening

### 4.2.2.1 Respondent Recruitment

A random sample of 3040 people (1520 males and 1520 females) was drawn from the population of full-time employees at the University of Michigan, assuming a 5% response rate. A recruitment email was sent to the entire sample. In the recruitment email, this study was described as research to investigate the health and social lives of Michigan employees. Participants would receive \$15 as a token of thanks for their participation. The methodological purposes of the study were not communicated to respondents in the recruitment or during the experiment so that the respondents would behave naturally. A recruitment email address was provided in the email invitation. People who were interested in participating would reply to that email address to schedule an interview. We also posted on-campus flyers at various locations to recruit participants. The content of the flyers was similar to that of the recruitment email. Twenty-four respondents, 12 males and 12 females, were recruited via email or on-campus flyers to participate in the interviewer screening. Those respondents were excluded from participation in the following main experiment.

### 4.2.2.2 Study Design

Each interviewer was randomly assigned one male and one female respondent and was asked to administer a 35 minute CAPI interview to each of the respondents. The questionnaire used in the screening was the same as the one that was used in the main laboratory experiment, including both non-sensitive and moderately sensitive items based on the question sensitivity assessment reported in section 4.1.

Following the interview, the respondent was given a self-administered Web survey to evaluate the interview and the interviewer's rapport. The questionnaire was adapted from the rapport measures used by Foucault (2010), which included several adjectives on seven-point Likert scales, which described the interviewing environment (e.g., well-coordinated and awkward ) and the interviewer's demeanor (e.g., similar to me and unreliable). Respondents were asked to rate the interview and the interviewer based on each adjective. Then, the ratings were added up to calculate a mean rapport score for each interviewer. The four interviewers with higher rapport ratings and the four with lower rapport ratings were selected to continue with the study. The remaining four interviewers with mid-rapport ratings were dropped from the study. It is worth noting that rapport is an interactive dynamic phenomenon rather than a personality trait of one or both conversational partners. I fully intended to use ratings of individual interviews in the main experiment but wanted to maximize the chances that there would be differences so selected interviewers rated high and low but not medium in rapport.

#### 4.2.2.3 Procedure

During the screening, the respondent first met with a greeter to go over the consent process. Then, the greeter guided the respondent to the interviewing room. The interviewer was required to come to the interviewing room 15 minutes prior to the scheduled interviewing time to set up the laptop computer and the room audio recording system. When the respondent entered the interviewing room, the interviewer first introduced herself and then started the CAPI interview. Once the interview was completed, the interviewer handed the computer to the respondent and asked the respondent to complete a self-administered Web survey to evaluate the interview and the interviewer. The interviewer then left the interviewing room to

allow the respondent the privacy to finish the self-administered survey. The interviewer waited outside of the interviewing room during the evaluation in case the respondent had any questions about the Web survey. Upon completion of the evaluation, the interviewer re-entered the room to thank the respondent and offered the \$15 incentive. All interviews were audio-recorded.

#### 4.2.2.4 Results

According to the respondents' rapport evaluation, we divided the 12 female interviewers into three categories: low rapport, mid rapport and high rapport interviewers. A difference of 1.15 on the mean rapport rating was found between the low and high rapport groups. The four interviewers in the mid rapport group were dropped from the main laboratory experiment.

**Table 4.2** Mean rapport ratings from the interviewer screening

	<b>N</b>	<b>Mean rapport rating</b>	<b>SE</b>
Low Rapport	8	4.48	0.20
Mid Rapport	8	5.26	0.18
High Rapport	8	5.63	0.16

#### 4.3 Study of Interviewer Voice

After the first interviewer training, and immediately before the interviewer screening, the 12 female interviewers who were originally recruited were asked to make audio recordings of themselves reading the ACASI questions and the response options. These recordings became the pool to create a different voice condition for each interviewer in the ACASI module.

Audio recordings of three questions were selected to create an approximately 65-second audio file that was used in the voice study, including one item at the beginning, two in the middle and another later in the questionnaire. They were: (1)

“During the past 12 months, have you driven a vehicle while you were under the influence of alcohol? Yes, No”; (2) “The next questions ask about the use of tranquilizers. Tranquillizers are usually prescribed to relax people, to calm people down, to relieve anxiety, or to relax muscle spasms. Some people call tranquilizers ‘never pills.’ We are interested in your use of any prescription tranquilizers that were not prescribed for you, or that you took only for the experience or feeling they caused. Click [NEXT] to continue”; (3) Have you ever, even once, used any tranquilizers that were not prescribed for you or that you took only for the experience or feeling it caused? Yes, No.”; and (4) “The next question asks how you have been feeling during the past 30 days. During the past 30 days, how often did you feel hopeless? Would you say...all of the time, most of the time, some of the time, a little of the time, none of the time.”

One hundred native speakers of American English aged 18 and older were recruited from Amazon Mechanical Turk to participate in a 15 minute Web survey to rate each of the 12 interviewers on her vocal and speech properties. One third of the respondents were male and the other two-thirds were female. The respondents tended to be younger and were primarily white. In order to qualify for the study, each MTurk worker was required to have a HIT approval rate greater than or equal to 85% and to be located in the United States in order to participate. The description of the HITS was worded as follows:

We are conducting a survey about people’s perceptions of interviewers’ voices. We need your help in evaluating twelve interviewers on their voice characteristics, such as the gender of the voice, the accent or dialect, and the voice animation. In the survey, you will be asked to listen to recordings of approximately 65 seconds each and then to rate the twelve interviewers on their voice characteristics. This task will

take approximately 25 minutes. We are **not** asking you to answer the survey questions, but want you to give us your thoughts about the voice characteristics of the interviewers. At the end of the survey, you will receive a code to paste into the box below to receive credit for taking our survey.

A link to the Web survey was provided after the description. Qualified MTurk workers who were interested in the HITs would click the link to enter the Qualtrics Web survey. Upon the completion of the Web survey, the MTurk worker would receive a randomly generated code to receive the \$0.50 monetary award from MTurk. It was a self-selected sample.

In order to create a different voice condition for each interviewer, we created a Qualtrics Web survey to evaluate the interviewer's voice on the following vocal and speech properties: (1) the masculinity or femininity of the voice (1=extremely feminine and 7=extremely masculine); (2) how animated is the voice (1=not at all animated and 7=extremely animated); (3) whether the person is a native speaker of some variety of American English (1=strong foreign or non-native accent and 7=native speaker of American English); (4) whether the person speaks with a distinctive regional or ethnic American English accent or dialect (1=Neutral or nondistinctive accent and 7=strong distinctive accent or dialect); and (5) whether this person sounds articulate and well-spoken, or does she stumble over her words (1=stumble over words and 7=articulated and well-spoken). Answers to these questions were taken as subjective measures. We also obtained three objective measures of the interviewers' vocal and speech attributes—pitch, speech rate and articulation rate. Five 10 second speech segments were randomly selected from the audio file for each interviewer. The verbal content of the five speech segments was the same. We used PRAAT (<http://www.fon.hum.uva.nl/praat/>), a software package



for the analysis of speech in phonetics, to generate the mean pitch, speech rate (number of syllables / total time) and articulation rate (number of syllables / total time-pausing time). Consequently, we had eight measures for each interviewer (five ratings and three objective measures) and used these measures as points in an eight-dimensional space to calculate the Mahalanobis distance between any two voices. The voice that had the largest Mahalanobis distance from the reference voice was taken as the different voice condition for that reference voice.

Seventeen pairs of voices were identified based on the first voice study. For the same interviewer, on some occasions, more than one voice was identified as different from the voice of that interviewer. Therefore, we conducted a second study to narrow down the number of pairs to be used in the main laboratory study. Ten male and 10 female Amazon Mechanical Turk workers who had not participated in the first voice rating study were recruited to participate in the second voice study. A web link to the Qualtrics questionnaire was given in the HITs. In this study, we asked the raters to compare how similar or different pairs of interviewers' voices sounded to them ("How similar or different do the two voices sound?" 1=extremely similar and 5=extremely different). They first listened to a recording of the pair of voices reading the same survey question ("During the past 12 months, have you driven a vehicle while you were under the influence of alcohol? Yes, No") and then rated the voice difference. The pairs of recordings were presented in a random order. Only one question was asked for each pair. The length of each recording was approximately 20 seconds. Raters were paid \$0.50 for this 20 minute Qualtrics Web survey. The voice pair with two voices that were rated as the most different was used to create the different voice condition in the ACASI module.

All of the voice pairs selected for use in the main laboratory experiment had a Mahalanobis distance equal to or larger than 4.35, as well as a vocal difference rating equal to or larger than 3.55. It seems that the two voices used in each pair were perceived as very different by the raters.

**Table 4.3** Mahalanobis distances and ratings on vocal differences for pairs of interviewer voices that were used in the main laboratory study

<b>Interviewer voice pair</b>	<b>Mahalanobis distance</b>	<b>Rating on vocal differences</b>	<b>SE</b>
Pair 1	4.39	3.75	0.26
Pair 2	4.58	4.10	0.22
Pair 3	4.55	3.85	0.20
Pair 4	4.35	4.60	0.13
Pair 5	4.51	3.55	0.25
Pair 6	4.38	3.75	0.19
Pair 7	4.58	4.10	0.22
Pair 8	4.65	3.95	0.22

#### *4.4 Experimental Design of the Main Study*

##### *4.4.1 Respondent Recruitment*

We recruited 128 respondents from the University of Michigan full-time staff employees via email and on-campus flyers. Three random samples were drawn from the population of full-time employees at the University of Michigan in order to recruit 128 respondents. The sample size for the first, second and third samples are 3040 (1520 males and 1520 females), 3000 (2000 males and 1000 females) and 6000 (4000 males and 2000 females), respectively. We increased the sample size for male respondents in the second and the third samples because of the lower participation rate of males. An email invitation was sent to all sampled persons by the University of Michigan Human Resources Records and Information Services. In the email invitation, this study was described as research to improve our understanding of the health and social lives of Michigan employees. The methodological purposes of the study were not communicated to the respondents in the recruitment or during the

experiment so that the respondents would behave naturally. The information provided to sampled persons was as follows:

The study will be conducted in the Survey Research Center (SRC) in the Institute for Social Research (ISR). It will take approximately one hour and eligible participants will be compensated \$15 cash for their time. As a participant, you will first take part in an interview, then complete a short questionnaire about the interview, and will finally complete a questionnaire on a computer. The subject concerns health, including sexual health, and social activities. All information you give us is voluntary and will be kept in the strictest confidence. Participants must be full-time employees at the University of Michigan to be considered eligible to participate.

A recruitment email address was provided in the email. People who were interested in participating would reply to that email address to schedule an interview. We also posted on-campus flyers at various locations to recruit participants. The content of the flyers was similar to that of the recruitment email. Respondents were randomly assigned to one of the experimental conditions at the time of recruitment.

**Table 4.4** Demographic Characteristics of the Participants

	Number	Percent
<b>Gender</b>		
Male	63	50.40
Female	62	49.60
<b>Age</b>		
31-33	31	24.80
34-42	27	21.60
43-53	32	25.60
54 and older	35	28.00
<b>Education</b>		
High school graduate	1	0.80
Some college, no degree	9	7.20
Associated degree: Occupational, technical or vocational program	1	0.80
Associated degree: Academic program	3	2.40
Bachelor's degree	52	41.60
Master's degree	39	31.20
Professional school degree	6	4.80
Doctoral degree	14	11.20
<b>Race</b>		
White	108	86.40
Black or African American	7	5.60
Asian	8	6.40
Mixed or other	2	1.60

#### 4.4.2 Questionnaires

Based upon the results of the question sensitivity assessment, non-sensitive and moderately sensitive questions were used in the mode comparison study (CAPI vs. Video-mediated interviews), whereas highly sensitive questions were used in the subsequent ACASI study. Because the CAPI interview was 35 minutes and the ACASI interview was 15 minutes, not all of the 190 questions from the sensitivity study were used in the main laboratory experiment.

The questionnaire in the mode comparison study in all conditions began with 19 items about dietary behaviors, continued with 14 items on health conditions, 11 items on mental health, 10 items on religion, voting and other social behaviors, six attitudinal items on consumer finances, four items about law-breaking behaviors, 22 items on the use of alcohol, tobacco production and the nonmedical use of

prescription drugs, 11 items on sexual behaviors, two items on income, and concluded with six demographic items. The questionnaire in the ACASI study began with four items on the use of alcohol, continued with four items on the use of marijuana or hashish, four items on the nonmedical use of prescription drugs, 15 items on sexual behaviors, three items on mental health and concluded with one item on weight.

Following the survey, respondents were given a set of debriefing questions to rate how much rapport they felt with the interviewer. The rapport scales were adapted from the measures used by Foucault (2010), which included several adjectives on seven-point Likert scales describing the interviewing environment (e.g., well-coordinated and awkward) and the interviewer's demeanor (e.g., similar to me and unreliable). Respondents were asked to rate the interview and the interviewer based on each adjective. In addition to the rapport scales, respondents were also asked to assess (1) whether they found the topics in the interview to be interesting; (2) how much they enjoyed taking part in the interview; and (3) how comfortable they were with the interview.

The interviewers were also given an evaluation questionnaire to answer after they administered the interview. The same rapport scales that were used in the respondent debriefing were used in the interviewer debriefing. In addition, interviewers were asked (1) whether they felt the respondents were honest even when they felt uneasy about answering; and (2) whether they have any other observations they would like to share.

Upon the completion of the ACASI module, respondents were given a set of debriefing questions to answer about their experience of the ACASI module, including items on (1) how much they enjoyed taking part in the module; (2) whether

they found the topics in the module to be interesting; (3) how much privacy they felt the method of interviewing provided them; (4) how concerned they were about the interviewer finding out how they answered the question; and (5) how comfortable they were with the interviewing method. In addition, respondents were asked how similar the voice used in the module sounded to the voice of the interviewer in the prior interviewer-administered interview. The answer to this item was used as the ACASI voice manipulation check.

All of the questionnaires were programmed with Qualtrics. Only one question was displayed on each page.

#### 4.4.3 Study Design

The laboratory experiment was made up of two related studies. The first study is a mode comparison between CAPI and video-mediated interviews that investigates (1) whether rapport can be similarly established in video-mediated and computer-assisted personal interviews (CAPI); and (2) whether video-mediated interviews increase the disclosure of moderately sensitive information to the same extent as CAPI. The second study is a ACASI study that investigates whether the interviewer-respondent interaction prior to the ACASI questions may affect sensitive disclosures in ACASI. To investigate these research questions, we created a  $2 \times 2 \times 2 \times 2$  fully crossed factorial design that varies the level of rapport in the prior interaction, the mode of data collection in the prior interaction, the vocal similarity of the interviewer in the prior interaction to the voice on the ACASI audio file and the version of the questionnaire. In the experiment, the respondent first completed a 35 minute interviewer-administered CAPI or a video-mediated interview, and then completed a 15 minute self-administered ACASI module.

The level of rapport in the prior interaction was difficult to manipulate, particularly for the nonverbal rapport behaviors of an interviewer. A screening procedure was used to select interviewers who naturally had higher or lower rapport. The interviewer selection was based upon respondents' evaluations of the interviewers' rapport level. We used the four high-rapport and the four low-rapport interviewers who were selected from the interviewer screening in the main study.

The mode of data collection in the prior interaction consisted of two conditions: CAPI and video-mediated interviews. Adobe Connect was used to mediate the video interviews, allowing showcards to be displayed remotely. In both conditions, the interviewer administered an approximately 35 minute interview to the respondent.

The voice similarity factor also encompassed two conditions: same voice and different voice. Only female interviewers were used in this study. With the same voice condition, a recording of the same female interviewer in the preceding module (CAPI or video-mediated interview) who read the question (both the question stem and the response options) was used in the ACASI module. With the different voice condition, a female voice that was different from the interviewer in the preceding module (CAPI or video-mediated interview) was used in the recording. Two studies of interviewers' voices were conducted to create the different voice condition for each interviewer. In the ACASI module, respondents were not able to skip to the next question until they heard the entire reading of the current question.

In addition, we varied the versions of the questionnaire. We divided the 43 highly sensitive items into three groups—Group A with 11 items, Group B with 11 items and Group C with 21 items. The grouping was done so that items in Group A

and Group B were on the same topics, with similar ratings of question sensitivity; for example, both Group A and Group B had an item on sexual behavior with sensitivity ratings of 4.25 and 3.91, respectively. The version of the questionnaire consisted of two conditions. In questionnaire version 1, Group A items were asked in the interviewer-administered interview (CAPI or video-mediated interview), whereas Group B and C items were asked in the ACASI module. In questionnaire version 2, Group B items were asked in the interviewer-administered interview, while Group A and C items were asked in the ACASI module.

**Table 4.5** The cell size for each of the experimental conditions

	High-rapport interviewer				Low-rapport interviewer			
	CAPI		Video-mediated interview		CAPI		Video-mediated interview	
	Same voice ACASI	Different voice ACASI	Same voice ACASI	Different voice ACASI	Same voice ACASI	Different voice ACASI	Same voice ACASI	Different voice ACASI
Questionnaire version 1	8	8	7	8	7	8	8	8
Questionnaire version 2	8	7	8	8	8	8	8	8

Note: The wrong questionnaire version was used in three of the 128 interviews due to interviewer administration errors. Those three interviews were removed from the data analysis.

#### 4.4.4 Procedure

Interested participants who replied to the recruitment email were asked to sign up for a one hour slot. Once an appointment was scheduled, the respondent would receive an email stating the location, date and time of the interview. At the scheduled interviewing date and time, a greeter met with the respondent, first, to go over the consent process, and then, to guide the respondent to the interviewing room. In the CAPI condition, the interviewer and the respondent sat in the same interviewing room. The interviewer was required to come to the interviewing room 15 minutes prior to



the scheduled time to set up the laptop computer, as well as the room audio recording system. When the respondent entered the room, the interviewer first introduced herself, and then, started the CAPI interview. Once the CAPI interview was completed, the interviewer handed the laptop computer to the respondent and asked the respondent to complete a self-administered evaluation of the CAPI interview. Then, the interviewer left the room to give the respondent the privacy to complete the evaluation. In the meantime, the interviewer filled out an evaluation questionnaire in the room next door. The respondent notified the interviewer that the evaluation was completed by opening the door of the interviewing room. Next, the interviewer opened the ACASI module and asked the respondent to put on headphones and to complete the self-administered Web survey. The interviewer waited outside the interviewing room during the ACASI module. Once the ACASI module was completed, the interviewer re-entered the room to open the ACASI evaluation questionnaire for the respondent, and then, left the room again. Once the respondent completed the ACASI evaluation, the interviewer entered the room again to thank the respondent and to hand the cash incentive to the respondent.

In the video-mediated condition, the interviewer and the respondent sat in two different rooms on two different floors. When the interviewer entered her room, the Adobe Connect videoconferencing system was set up for use. After the consent process, the greeter guided the respondent to the other interviewing room and gave instructions on how to use the videoconferencing system. When the short instruction was complete, the greeter handed the cash incentive to the respondent and left the room. Next, the interviewer introduced herself and started the video-mediated interview. Showcards were used in some of the questions. In the video-mediated interview, all of the showcards were saved as PDF files on the desktop. When a

showcard was required, the interviewer gave instructions to the respondent about how to open the PDF file and find the relevant showcard. The survey links to the video-mediated interview evaluation, the ACASI module and the ACASI evaluation were saved in one Microsoft Word document and saved on the computer desktop. Once the video-mediated interview was completed, the interviewer gave instructions to the respondent via video to open the evaluation questionnaire. The video-mediated evaluation questionnaire was displayed as a full screen for the respondent. The interviewer stayed online, but muted herself during the evaluation in case the respondent had any questions. While the respondent answered the video-mediated interview evaluation, the interviewer answered the interviewer evaluation questionnaire. The respondent returned to the videoconferencing room and spoke to the interviewer upon the completion of the evaluation. Then, the interviewer gave the respondent the instructions to open the ACASI module. Again, the interviewer stayed online while the respondent answered the self-administered ACASI questionnaire. The interviewer made it clear to the respondent that she would not be able to see or hear any of the ACASI questions or responses. Once the ACASI module was completed, the interviewer gave the respondent the instruction over the video to finish the ACASI evaluation. When this evaluation was completed, the interviewer closed the interview by thanking the respondent for participating.

All of the interviewers and respondents were debriefed at the end of the project. The true purpose of the study was revealed to all participants via email.

## Chapter 5 Results: CAPI vs. Video-Mediated Interviews on Rapport Evaluation and Disclosure of Moderately Sensitive Information

This chapter presents the results of the mode comparison between CAPI and video-mediated interviews on rapport establishment and disclosure of moderately sensitive information. First, I examined rapport ratings from both interviewers and respondents. Then, I tested the research hypotheses on responses to individual survey questions. Furthermore, I pooled all items to examine the pattern of results across the questionnaire. Finally, I examined responses to the respondent debriefing questions.

### *5.1 Respondents' and Interviewers' Rapport Evaluation*

Both interviewers and respondents were asked to assess the rapport they felt during the interview at the end of the CAPI or video-mediated interviews using the same two rapport scales. The respondents' and interviewers' mean rapport ratings were 5.21 (n=125, SD=0.76) and 4.81 (n=124, SD=0.74), respectively. The correlation between the respondents' and the interviewers' rapport ratings was small and insignificant ( $\rho = 0.11$ ,  $p = 0.21$ ). Low variation was found on mean rapport ratings among interviewers; for example, the difference between the highest and lowest mean respondents' rapport ratings for interviewers was only 0.79 (Table 5.1). As Table 5.2 shows, the respondents' ratings of rapport varied for each interviewer. Interviewers who were rated high or low in rapport during the interviewer screening received low or high rapport ratings, respectively, for some of the interviews they conducted. The data supports the argument that rapport is an interactive dynamic phenomenon rather than a personality trait of one or both conversational partners. In

addition, as mentioned in the literature review, respondents' ratings are more precise than interviewers' ratings. I therefore used the respondents' rapport ratings for their individual interviews in the following analysis. In other words, rapport was an observational rather than an experimental variable in the following analysis.

**Table 5.1** Respondents' and Interviewers' Rapport Evaluation Comparison

Interviewer	Pre-Identified Rapport Status	Number of Interviews	Mean Respondents' Rapport Rating	Mean Interviewers' Rapport Rating
6	Low	15	4.73	5.18
2	Low	16	4.90	4.29
5	High	14	4.95	4.96
8	Low	16	5.27	4.26
7	High	16	5.29	3.95
4	High	16	5.42	5.61
1	High	16	5.52	5.29
3	Low	16	5.52	4.91

**Table 5.2** Respondents' Rapport Ratings for Each Interviewer

Interviewer	Pre-Identified Rapport Status	N	Maximum Rapport Rating	Minimum Rapport Rating	Mean	Std Dev
1	High	16	6.73	4.03	5.52	0.75
2	Low	16	6.29	3.70	4.90	0.79
3	Low	16	6.47	4.03	5.52	0.70
4	High	16	6.33	3.90	5.42	0.68
5	High	14	6.07	3.23	4.95	0.66
6	Low	15	6.40	3.50	4.73	0.81
7	High	16	6.63	4.27	5.29	0.75
8	Low	16	6.40	4.37	5.27	0.59

## 5.2 CAPI vs. Video-Mediated Interviews on Respondents' Rapport Ratings

First, a t-test for independent means examined whether rapport was established similarly in video-mediated interviews and CAPI (see Table 5.3). The mean respondents' rapport ratings for video-mediated interviews and CAPI were 5.11 (n=63, SD=0.82) and 5.30 (n=62, SD=0.68), respectively. The test result was not

significant ( $t=1.40$ ,  $p=0.16$ ), suggesting no evidence that rapport is any better established in CAPI than video-mediated interviews.

**Table 5.3** Respondents' Mean Rapport Ratings for CAPI and Video-Mediated Interviews

	Mode		$t$	$df$
	CAPI (SE)	Video-Mediated Interviews (SE)		
Respondents' Rapport Rating	5.30 (0.68)	5.11 (0.82)	1.40	123

### 5.3 Analysis on Responses to Individual Survey Questions

The focus of the current study was to examine the effect of high rapport compared to low rapport on disclosure of moderately sensitive information rather than investigating how disclosure changes as rapport ratings increase by one unit. I therefore recoded rapport into a binary variable below and at/above the 3<sup>rd</sup> quartile: (1) smaller than 5.83 and (2) equal to or larger than 5.83. I expected rapport would most strongly impact disclosure among observations falling at or above the 3<sup>rd</sup> quartile compared to observations below the 3<sup>rd</sup> quartile. Thus, more emphasis was given to interviews with higher rapport ratings where stronger effects were expected.

In order to investigate whether video-mediated interviews increase disclosure of moderately sensitive information to the same extent as CAPI, I examined the effects of mode, rapport, and the mode by rapport interaction on responses to individual questions. I used logistic regression for the forty-four questions with yes/no responses, ordinal logistic regression for the five questions with an ordered response scale (e.g. Never; 1-2 times, 3-5 times, More than 5 times), and multinomial logistic regression for the eight questions with an unordered response scale.

When the outcome variable was dichotomous or binary, the logistic regression model was specified as:

$$\log it(\pi(x)) = \ln\left(\frac{\pi(x)}{1-\pi(x)}\right) = \beta_0 + \beta_1 Mode + \beta_2 Rapport + \beta_3 Mode \times Rapport$$

where  $\ln\left(\frac{\pi(x)}{1-\pi(x)}\right)$  is the log-odds of disclosure of sensitive information relative to no disclosure,  $\beta_0$  represents the estimated intercept,  $\beta_1$  represents the contrast in log-odds between video-mediated interviews and CAPI for low-rapport interviews (the reference level for rapport) and is combined with the parameter  $\beta_3$  for the (video-mediated interviews  $\times$  high rapport) product term to define the same contrast in log-odds for high rapport interviews.  $\beta_2$  represents the contrast in log-odds between high and low rapport for CAPI (the reference level for mode) and is combined with the parameter  $\beta_3$  for the (video-mediated interviews  $\times$  high rapport) product term to define the same contrast in log-odds for video-mediated interviews.

When the outcome variable was an ordinal scale, the cumulative logit regression model was specified as follows:

$$\begin{aligned} \ln\left[\frac{\Pr(y \leq k | x)}{\Pr(y \leq k | x)}\right] &= \ln\left[\frac{\Pr(y = 1 | x) + \dots + \Pr(y = k | x)}{\Pr(y = k + 1 | x) + \dots + \Pr(y = K | x)}\right] = \\ &= \beta_{0(k)} - (\beta_1 Mode + \beta_2 Rapport + \beta_3 Mode \times Rapport) \end{aligned}$$

For an ordinal variable with K categories, K-1 cumulative logit functions are defined. Each cumulative logit function includes a unique intercept  $\beta_{0(k)}$  but all share a common set of three regression parameters.

When the outcome variable was a nominal scale, the multinomial logit regression was specified as follows, assuming that the categories of the outcome variable were coded as 0, 1, or 2:

$$\ln \left[ \frac{\Pr(y = 1 | x)}{\Pr(y = 0 | x)} \right] = \beta_{10} + \beta_{11}Mode + \beta_{12}Rapport + \beta_{13}Mode \times Rapport$$

and

$$\ln \left[ \frac{\Pr(y = 2 | x)}{\Pr(y = 0 | x)} \right] = \beta_{20} + \beta_{21}Mode + \beta_{22}Rapport + \beta_{23}Mode \times Rapport$$

Conventionally, people seem to underreport socially undesirable behaviors but overreport socially desirable behaviors (Tourangeau & Yan, 2007). Given the absence of true values in the current study, I expected more disclosure of sensitive information to be associated with higher reporting of socially undesirable behaviors as well as lower reporting of socially desirable behaviors. Table 5.4 presents the predicted direction of misreporting given question topics. Religion and voting are considered socially desirable behaviors and overreporting has occurred in reports about church attendance (Presser & Stinson, 1998) and voting (Belli, Traugott, & Beckmann, 2001). Health conditions (e.g. “Have you ever been told by a doctor, nurse, or other professional that your blood cholesterol is high?”), mental health (e.g. “During the past 30 days, how often did you feel so sad or depressed that nothing could cheer you up?”), alcohol consumption, use of tobacco products, nonmedical use of prescription drugs, and homosexual experience are considered socially undesirable behaviors. The literature has found that respondents tend to underreport the consumption of alcohol (Lemmens, Tan, & Knibbe, 1992), smoking (Patrick et al., 1994), and the use of illicit drugs (Fendrich & Vaughn, 1994; Johnson & O’Malley, 1997). In the current study, I also asked respondents a few attitudinal questions on consumer finance, such as “Would you say that you are better or worse off financially than you were a year ago,” and “As to the economic policy of the government—I mean steps taken to fight inflation or unemployment—would you say the government is doing a good job, only

fair, or a poor job?”. I expected more honest responses to these two questions would be “worse off” and “poor job”, respectively.

**Table 5.4** Survey Topics and Predicted Direction of Misreporting and Disclosure

<b>Question Topic</b>	<b>Type of Behaviors</b>	<b>Direction of Misreporting</b>	<b>Disclosure</b>
Religion	Socially desirable behaviors	Overreporting	Less reporting
Voting	Socially desirable behaviors	Overreporting	Less reporting
Health Conditions	Socially undesirable behaviors	Underreporting	More reporting
Mental Health	Socially undesirable behaviors	Underreporting	More reporting
Alcohol Consumption	Socially undesirable behaviors	Underreporting	More reporting
Use of Tobacco Product	Socially undesirable behaviors	Underreporting	More reporting
Nonmedical Use of Prescription Drugs	Socially undesirable behaviors	Underreporting	More reporting
Homosexual Experience	Socially undesirable behaviors	Underreporting	More reporting

Table 5.5 presents estimated logistic regression coefficients for individual questions with marginally significant or significant mode or rapport effects on disclosure of moderately sensitive information. When an independent variable is involved in an interaction there is no single odds ratio estimate for it. Instead, the odds ratio of that variable depends on the levels of the interacting variable. Table 5.6 presents estimated ratio of odds for mode and rapport taking into account the mode by rapport interaction for models provided in Table 5.5. Appendix B contains estimated logistic regression coefficients for mode, rapport, and mode by rapport interaction for all individual questions in CAPI or video-mediated interviews.



**Table 5.5** Individual Questions showing Marginally Significant or Significant Mode or Rapport Effects on Disclosure of Moderately Sensitive Information in CAPI/video-mediated Interviews

		<b>Mode: Video- Mediated Interview</b>	<b>Rapport: High Rapport</b>	<b>Interaction: Video- Mediated Interview × High Rapport</b>
<b>Model Type</b>	<b>Survey question</b>	<b>Estimate (SE)</b>	<b>Estimate (SE)</b>	<b>Estimate (SE)</b>
Logistic Regression	Sleeping disorder	0.95* (0.46)	0.38 (0.64)	0.43 (0.88)
	Feel depressed in the past 30 days+	-0.28 (0.46)	-1.98# (1.08)	1.10 (1.36)
	Ever smoked a cigarette	0.52 (0.42)	1.22# (0.64)	-0.60 (0.92)
	Attended church, synagogue, or mosque almost every week in the past 12 months	0.84# (0.50)	0.85 (0.71)	-1.87# (0.96)
Ordinal Logistic Regression	Days drank one or more alcoholic drinks in the past 30 days++	0.51 (0.40)	0.98# (0.57)	-1.47# (0.78)
Multinomial Logistic Regression	A year from now will be better off or worse off financially	-1.09* (0.43)	-0.36 (0.57)	0.61 (0.81)
	Good times or bad times financially for business conditions in the next 12 months	-1.02* (0.49)	-0.63 (0.66)	0.52 (0.87)
	Income expectation in the next 12 months	-1.31* (0.54)	-0.71 (0.73)	1.49^ (1.00)
	Income increase in the next five years or so++	0.94* (0.40)	1.02# (0.53)	-0.67 (0.75)

Note: Reference categories for predictors were: Mode (CAPI) and Rapport (Low).

Models are presented by the type of responses: logistic regression models for yes/no responses, ordinal logistic regression models for ordered response scales, multinomial logistic regression models for nominal response scales.

+Ordinal outcome variable (All of the time; Most of the time; Some of the time; A little of the time; and None of the time) recoded into a binary variable (Yes/No).

++A non-normally distributed continuous outcome variable recoded into ordinal or nominal variables depending on the distribution.

^p<0.20; #p<0.10; \*p<0.05

**Table 5.6** Estimated Odds Ratio for Individual Questions with Marginally Significant or Significant Mode or Rapport Effects on Disclosure of Moderately Sensitive Questions in CAPI/video-mediated Interviews

Survey Question	Video-Mediated Interview vs. CAPI		High Rapport vs. Low Rapport	
	High Rapport	Low Rapport	Video-Mediated Interview	CAPI
	Odds Ratio (CI)	Odds Ratio (CI)	Odds Ratio (CI)	Odds Ratio (CI)
Sleeping disorder	4.00 (0.94-17.11)	2.59 (1.04-6.44)	2.25 (0.70-7.22)	1.46 (0.42-5.13)
Feel depressed in the past 30 days+	2.29 (0.19-27.99)	0.76 (0.31-1.89)	0.42 (0.08-2.11)	0.14 (0.02-1.15)
Ever smoked a cigarette	0.92 (0.19-4.54)	1.68 (0.74-3.86)	1.86 (0.52-6.67)	3.40 (0.96-12.02)
Attended church, synagogue, or mosque almost every week in the past 12 months	0.36 (0.07-1.78)	2.31 (0.86-6.19)	0.36 (0.10-1.28)	2.33 (0.58-9.39)
Days drank one or more alcoholic drinks in the past 30 days++	0.38 (0.10-1.41)	1.66 (0.75-3.66)	0.61 (0.22-1.74)	2.67 (0.88-8.16)
A year from now will be better off or worse off financially	0.62 (0.16-2.38)	0.34 (0.15-0.77)	1.28 (0.41-3.98)	0.70 (0.23-2.11)
Good times or bad times financially for business conditions in the next 12 months	0.61 (0.15-2.52)	0.36 (0.14-0.94)	0.89 (0.29-2.75)	0.53 (0.15-1.93)
Income expectation in the next 12 months	1.20 (0.23-6.27)	0.27 (0.09-0.77)	2.18 (0.56-8.46)	0.49 (0.12-2.04)
Income increase in the next five years or so++	1.31 (0.37-4.61)	2.55 (1.17-5.55)	1.42 (0.50-4.06)	2.77 (0.97-7.90)

**Note:** Reference categories for predictors were: Mode (CAPI) and Rapport (Low).

CI presents the confidence interval of the estimated odds ratio.

+Ordinal outcome variable (All of the time; Most of the time; Some of the time; A little of the time; and None of the time) recoded into a binary variable (Yes/No).

++A non-normally distributed continuous outcome variable recoded into ordinal or nominal variables depending on the distribution.

The effects of mode on disclosure were positive and significant ( $p < 0.05$ ) for two questions. The estimated odds ratio of admitting sleep trouble in video-mediated interviews relative to CAPI was 4.00 when rapport was high and 2.59 when rapport was low. The estimated odds ratio of expecting personal income to increase more than

the rate of inflation over the next five years or so in video-mediated interviews relative to CAPI was 1.31 when rapport was high and 2.55 when rapport was low.

The effects of mode on disclosure were negative and significant ( $p < 0.05$ ) for three questions. The estimated odds ratio of expecting to be worse off financially a year from now in video-mediated interviews relative to CAPI was 0.62 when rapport was high and 0.34 when rapport was low. The estimated odds ratio of expecting the business condition in the country as a whole to be worse off in the next 12 months in video-mediated interviews relative to CAPI was 0.61 when rapport was high and 0.36 when rapport was low. In addition, the estimated odds ratio of expecting personal income to be lower than the past year in video-mediated interviews relative to CAPI was 1.20 when rapport was high and 0.27 when rapport was low.

The effects of mode on disclosure were positive and marginally significant ( $p < 0.10$ ) for one question. The estimated odds ratio of admitting to not attending church, synagogue, or mosque almost every week in the past 12 months in video-mediated interviews relative to CAPI was 0.36 when rapport was high and 2.31 when rapport was low.

The effects of rapport on disclosure were positive and marginally significant ( $p < 0.10$ ) for three questions. The estimated odds of admitting having smoked part or all of a cigarette in high-rapport interviews relative to low-rapport interviews was 1.86 in video-mediated interviews and 3.40 in CAPI. The estimated odds of admitting having one or more alcoholic drinks for at least ten days in the past 30 for high-rapport interviews relative to low-rapport interviews was 0.61 in video-mediated interviews and 2.67 in CAPI. The estimated odds of expecting personal income to increase more than the rate of inflation during the next five years or so in high-rapport

interviews relative to low-rapport interviews was 1.42 in video-mediated interviews and 2.77 in CAPI.

The effects of rapport on disclosure were negative and marginally significant ( $p < 0.10$ ) for one question. The estimated odds of admitting feeling sad or depressed that nothing could cheer one up during the past 30 days in high rapport interviews relative to low rapport interviews was 0.42 in video-mediated interviews and 0.14 in CAPI.

It seems that the effects of mode and rapport on disclosure of moderately sensitive information vary depending on individual questions. In order to see whether the effects follow certain pattern across the questionnaire, I grouped individual questions under particular survey topics and used random-effects multilevel multinomial logistic regression models treating respondents as nested within interviewers as well as the data nested within respondents. These models estimated the probability of disclosure taking into account all the questions under that particular topic. Detailed modeling information is provided in Appendix C.

**Table 5.7** Probability of Disclosure given Question Topics in CAPI/video-mediated Interviews

Topic	Rapport (%)	
	High	Low
Health Conditions	28.96	23.20
Mental Health	48.73	58.30
Religion and Voting	6.00	11.41
Consumer Finance	20.96	17.10
Alcohol Consumption	54.18	51.28
Use of Tobacco Products	30.55	30.49
Nonmedical Use of Prescription Drugs	15.33	4.72
Sexual Behaviors	46.51	38.13

Note: Probabilities were calculated based on estimated marginal means

Table 5.7 compares the probability of disclosure in high rapport interviews with that in low rapport interviews for each topic. The probabilities were calculated based on estimated marginal means. The probability of disclosure was higher in high rapport interviews for topics related to health conditions, consumer finance, alcohol consumption, use of tobacco products, nonmedical use of prescription drugs, and sexual behaviors. However, the probability of disclosure was higher in low rapport interviews for topics related to mental health, religion and voting. It appears that people were more disclosive in a low rapport interview relative to a high rapport interview when answering questions about mental health, religion, and voting. Questions on these topics comprised 1/3 to 1/2 of the questionnaire. I therefore created a variable *question position* (first 1/3 of the questionnaire, 1/3 to 1/2 of the questionnaire, and last 1/2 of the questionnaire) and used it in the overall multilevel multinomial logistic regression (see Section 5.4.3). More than one hundred questions were asked during the interview. Non-sensitive questions were placed between the sensitive questions and thus question position was not used as a continuous variable.

#### *5.4 Multilevel Multinomial Logistic Regression Analysis on Disclosure in CAPI/Video-mediated Interviews*

To boost power and examine the pattern of results across the entire questionnaire, I pooled all questions to examine the probability of disclosure on moderately sensitive information in CAPI or video-mediated interviews. I fitted random-effects multinomial logistic regression models that treated respondents as clustered by interviewers as well as the response data clustered by respondents; the probability of disclosure, taking into account all the questions in the CAPI/video-mediated interviews, was estimated. There were two main reasons for choosing multilevel models including random interviewer and respondent effects. First, the

accuracy of the observations may be correlated within a given interviewer or respondent. Second, this model provided the estimation of correct standard errors that reflected within-interviewer as well as within-respondent correlations for the values of the dependent variable.

I first examined the effects of mode on disclosure. I then added rapport into the model. Rapport was rated by respondents at the end of the CAPI or video-mediated interviews, which was not an experimental variable but rather observational data. Finally, I added question position, question sensitivity, and all possible two-way and three-way interactions into the model to explore any additional information the data provided.

All models were fitted using Laplace estimation with SAS 9.3. Laplace estimation is an integral approximation method that provides estimates with better statistical properties as well as the value of the log likelihood as the solution for testing and model comparisons. The R-side random effects, however, are not permitted with Laplace (Schabenberger, 2007).

#### 5.4.1 The Effects of Mode on Disclosure

I first fitted a random-effects multilevel multinomial logistic regression model to estimate the probability of disclosure with mode. I also included random effects associated with interviewer intercepts as well as random effects associated with respondent intercepts.

After fitting the full model, I first tested whether the random effects associated with interviewer intercepts could be omitted from the full model. The test result showed that variance components for the random effects associated with interviewers

was estimated to be zero. This indicated that there was not enough variation in the responses to attribute any variation to the random effects associated with interviewers after controlling for everything else in the model (Kiernan, Tao, & Gibbs, 2012). I therefore removed the random effects associated with interviewer intercepts from the model. I then tested whether the random effects associated with respondent intercepts could be omitted. Variances of random intercepts were tested against zero using the appropriate likelihood ratio test, based on maximum likelihood estimation. The test results rejected the null hypothesis and I therefore retained the random effects associated with respondents in the model. The model was specified as follows:

$$\log \left[ \frac{p_{ij}}{1 - p_{ij}} \right] = \beta_0 + \beta_1 Mode_j + u_j + \varepsilon_{ij}$$

where  $\log \left[ \frac{p_{ij}}{1 - p_{ij}} \right]$  represents the logit of the probability of disclosure of moderately sensitive information for survey response  $i$  nested within respondent  $j$ ,  $\beta_0$  and  $\beta_1$  represent the fixed intercept and the fixed effects of mode,  $u_j$  is the random effect associated with the intercept for respondent  $j$ , and  $\varepsilon_{ij}$  represents the residual. I assumed that the random effects,  $u_j$ , associated with respondents, and the residuals,  $\varepsilon_{ij}$ , were all mutually independent.

The distribution of the random effects associated with the respondents was:

$$u_j \sim N(0, \sigma_{\text{int:respondent}}^2)$$

where  $\sigma_{\text{int:respondent}}^2$  represents the variance of the respondent-specific random intercepts.

The distribution of the residuals associated with the response-level observations is

$$\varepsilon_{ij} \sim N(0, \sigma^2)$$

where  $\sigma^2$  represents the residual variance.

The estimated residual variance of the random effects associated with the intercept for respondents was 0.10. The residual intraclass correlation coefficient was calculated as

$$ICC = \frac{\sigma_{u_j}^2}{\sigma_{u_j}^2 + \pi^2/3} = 0.02$$

Table 5.8 presents estimates of the parameters in the multilevel multinomial logistic regression model including mode and the random effects associated with respondent intercepts. As Table 5.8 shows, mode has marginally significant effects on disclosure. Table 5.9 presents the estimated marginal means and associated probability of disclosure. The probability of disclosure in video-mediated interviews was 2.16% higher than in CAPI, which is in the opposite direction of the hypothesis.

**Table 5.8** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with mode and random effects associated with respondent intercepts

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-0.86	0.06	-15.41***	123
Mode	Video-mediated Interviews	0.10	0.08	1.30^	123
Covariance Parameter		Estimate	SE		
$\sigma_{\text{int:respondent}}^2$		0.10	0.02		

Note: ^p<0.20, \*\*\*p<0.0001



**Table 5.9** Estimated marginal means and associated probability of disclosure for mode for the model provided in Table 5.8

Parameter	Estimate	SE	Probability of Disclosure (%)
<b>Mode</b>			
Video-mediated Interviews	-0.76	0.06	31.81
CAPI	-0.86	0.06	29.65

#### 5.4.2 The Effects of Mode and Rapport on Disclosure

Next, I fitted a multilevel multinomial logistic regression on disclosure with mode and one variable based on observational data—rapport, as well as random effects associated with interviewer intercepts and random effects associated with respondent intercepts. With appropriate likelihood ratio test, the random effects associated with interviewer intercepts were omitted because the variance components were estimated to be zero, whereas the random effects associated with respondent intercepts were retained. The model was specified as follows:

$$\log \left[ \frac{p_{ij}}{1 - p_{ij}} \right] = \beta_0 + \beta_1 \text{Mode}_j + \beta_2 \text{Rapport}_j + u_j + \varepsilon_{ij}$$

where  $\log \left[ \frac{p_{ij}}{1 - p_{ij}} \right]$  represents the logit of the probability of disclosure of moderately

sensitive information for survey response  $i$  nested within respondent  $j$ ,  $\beta_0$  through

$\beta_2$  represent the fixed intercept and the fixed effects of the covariates (mode and

rapport),  $u_j$  is the random effect associated with the intercept for respondent  $j$ , and

$\varepsilon_{ij}$  represents the residual. I assumed that the random effects,  $u_j$ , associated with

respondents, and the residuals,  $\varepsilon_{ij}$ , were all mutually independent. The estimated

residual variance of the random effects associated with the intercept for respondents

was 0.10. The residual intraclass correlation coefficient was 0.02.

Table 5.10 presents estimates of the parameters in the multilevel multinomial logistic regression model including two predictors (mode and rapport) and the random effects associated with respondent intercepts. As Table 5.10 shows, mode has marginally significant effects on disclosure when controlling for rapport; whereas rapport has no significant effects on disclosure when controlling for mode. Table 5.11 presents the estimated marginal means and associated probability of disclosure. The probability of disclosure in video-mediated interviews was 2.18% higher than in CAPI, which is in the opposite direction of the hypothesis.

**Table 5.10** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with mode, rapport, and random effects associated with respondent intercepts

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-0.87	0.06	-14.23***	122
Mode	Video-mediated Interview	0.10	0.08	1.31^	122
Rapport	High	0.03	0.09	0.34	122
Covariance Parameter		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.10	0.02		

Note: ^p<0.20, \*\*\*p<0.0001

**Table 5.11** Estimated marginal means and associated probability of disclosure for mode and rapport for the model provided in Table 5.10

Parameter	Estimate	SE	Probability of Disclosure (%)
Mode			
Video-mediated Interview	-0.76	0.06	31.97
CAPI	-0.86	0.06	29.79
Rapport			
High	-0.79	0.08	31.20
Low	-0.82	0.05	30.55

#### 5.4.3 The Effects of Mode, Rapport, Question Position, and Question Sensitivity on Disclosure

In order to explore the additional information the data provided, I fitted a random-effects multilevel multinomial logistic regression model to predict disclosure with one experimental variable (mode), variables based on observational data (rapport and

question position) and the covariate (question sensitivity) as well as all possible two-way and three-way interactions. I must note that the inclusion of interactions was exploratory and intended to generate hypotheses for future research, as no empirical work or theory exists that would support expectations for which of these interactions would be significant.

I constructed models of disclosure using the “top-down” model building strategy discussed by West, Welch, and Galecki (2007) and Verbeke and Molenberghs (2000) for multilevel modeling problems. I started with an initial full model, including fixed effects of mode, rapport, question position, question sensitivity, and all possible interactions. The model also included random effects associated with interviewers as well as random effects associated with respondents. The random effects associated with interviewer intercepts were omitted because the variance components were estimated to be zero. I then tested whether the random effects associated with respondent intercepts could be omitted. Variances of random intercepts were tested against zero using an appropriate likelihood ratio test, based on maximum likelihood estimation. The test results rejected the null hypothesis and I therefore retained the random effects associated with respondents in the model. Next, I tested whether fixed-effect parameters of all the interactions are needed in the model using appropriate likelihood ratio tests. The final model was specified as follows:

$$\log \left[ \frac{p_{ij}}{1 - p_{ij}} \right] = \beta_0 + \beta_1 Mode_j + \beta_2 Rapport_j + \beta_3 Position1_j + \beta_4 Position2_j + \beta_5 Sensitivity_j + \beta_6 Rapport_j \times Position1_j + \beta_7 Rapport_j \times Position2_j + \beta_8 Sensitivity_j \times Position1_j + \beta_9 Sensitivity_j \times Position2_j + u_j + \varepsilon_{ij}$$

where  $\log\left[\frac{p_{ij}}{1-p_{ij}}\right]$  represents the logit of the probability of disclosure of moderately sensitive information for survey response  $i$  nested within respondent  $j$ ,  $\beta_0$  through  $\beta_9$  represent the fixed intercept and the fixed effects of the covariates and the interactions,  $u_j$  is the random effect associated with the intercept for respondent  $j$ , and  $\varepsilon_{ij}$  represents the residual. I assumed that the random effects,  $u_j$ , associated with respondents, and the residuals,  $\varepsilon_{ij}$ , were all mutually independent.

The distribution of the random effects associated with the respondents was:

$$u_j \sim N(0, \sigma_{\text{int:respondent}}^2)$$

where  $\sigma_{\text{int:respondent}}^2$  represents the variance of the respondent-specific random intercepts.

The distribution of the residuals associated with the response-level observations is

$$\varepsilon_{ij} \sim N(0, \sigma^2)$$

where  $\sigma^2$  represents the residual variance.

The estimated residual variance of the random effects associated with the intercept for respondents was 0.10. The residual intraclass correlation coefficient was calculated as

$$ICC = \frac{\sigma_{u_j}^2}{\sigma_{u_j}^2 + \pi^2/3} = 0.03$$

Details on model selection are provided in Appendix D.

Table 5.12 presents estimates of the parameters in the final multilevel multinomial logistic regression model including the respondent-level (mode, rapport, and question position) and response-level (question sensitivity) predictors and the random effects associated with respondent intercepts. Table 5.12 shows that several predictors had marginally significant or significant effects on disclosure when controlling for all the other predictors. Because interactions between predictor variables were included in the model, the interpretation of the odds ratios was complicated. I therefore created Table 5.13 to present the estimated marginal means and associated probability of disclosure for all predictors and different combinations of the predictors involved in the interactions.

**Table 5.12** Parameter estimates in the final multilevel multinomial logistic regression model, predicting the probability of disclosure of moderately sensitive information in CAPI/video-mediated interviews using random effects associated with respondent intercepts

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-1.34	0.09	-14.26***	122
Mode	Video-mediated Interviews	0.11	0.08	1.36^	122
Rapport	High	0.35	0.15	2.29*	122
Question Position	Last 1/2	0.57	0.10	5.81***	246
	1/3-1/2	0.96	0.10	9.29***	246
Question Sensitivity	High	-1.76	0.29	-6.04***	124
Rapport × Question Position	High Rapport × Last 1/2	-0.19	0.16	-1.16	246
	High Rapport × 1/3-1/2	-0.68	0.17	-3.91***	246
Question Position × Question Sensitivity	Last 1/2 × High Sensitivity	1.42	0.30	4.69***	248
	1/3-1/2 × High Sensitivity	1.79	0.31	5.83***	248
Covariance Parameter		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.10	0.03		

Note: Reference categories for predictors were: Mode (CAPI); Rapport (low-rapport interview); Question Position (first 1/3 of the questionnaire); Question Sensitivity (low).

The estimation method was Laplace.

^p<0.20; #p<0.10; \*p<0.05; \*\*p<0.01; \*\*\*p<0.0001

**Table 5.13** Estimated marginal means and associated probability of disclosure for all predictors and different combinations of the predictors involved in the interactions for the model provided in Table 5.12

Parameter	Estimate	SE	Probability of Disclosure (%)
<b>Mode</b>			
Video-mediated Interviews	-1.03	0.08	26.22
CAPI	-1.14	0.08	24.17
<b>Rapport</b>			
High	-1.06	0.09	25.72
Low	-1.12	0.07	24.66
<b>Question Position</b>			
First 1/3	-1.99	0.15	12.03
1/3-1/2	-0.47	0.06	38.37
Last 1/2	-0.80	0.06	30.93
<b>Question Sensitivity</b>			
High	-1.44	0.11	19.22
Low	-0.74	0.05	32.26
<b>Rapport × Question Position</b>			
High Rapport × First 1/3	-1.82	0.18	13.99
High Rapport × 1/3-1/2	-0.64	0.11	34.48
High Rapport × Last 1/2	-0.72	0.10	32.63
Low Rapport × First 1/3	-2.16	0.16	10.31
Low Rapport × 1/3-1/2	-0.31	0.06	42.41
Low Rapport × Last 1/2	-0.88	0.06	29.28
<b>Question Position × Question Sensitivity</b>			
First 1/3 × High Sensitivity	-2.87	0.29	5.36
1/3-1/2 × High Sensitivity	-0.46	0.08	38.67
Last 1/2 × High Sensitivity	-0.98	0.07	27.39
First 1/3 × Low Sensitivity	-1.11	0.08	24.84
1/3-1/2 × Low Sensitivity	-0.49	0.08	38.06
Last 1/2 × Low Sensitivity	-0.63	0.07	34.72

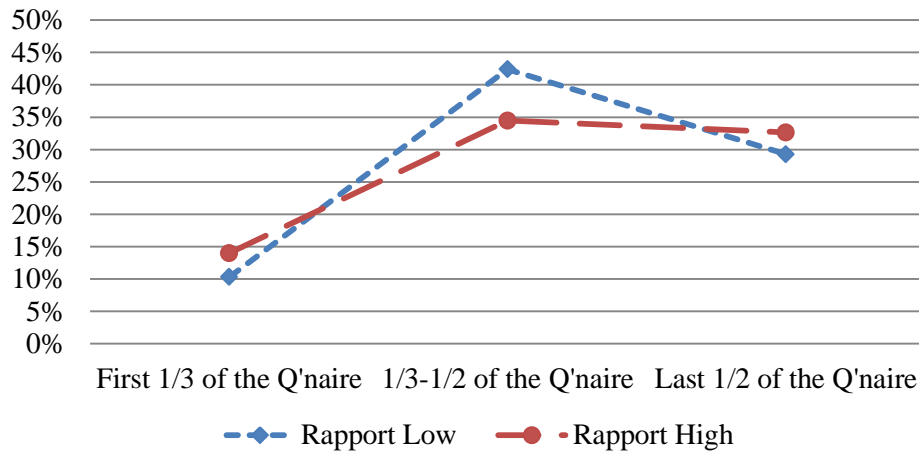
Note: Probabilities were calculated based on estimated marginal means.

Table 5.13 presents the estimated marginal means and associated probability of disclosure for all predictors and different combinations of the predictors involved in the interactions used in the final model. The probability of disclosure in video-mediated interviews was 2.05% higher than in CAPI ( $F_{121}^1=1.84$ ,  $p=0.18$ ), which is in the opposite direction of the hypothesis. Compared with the first 1/3 of the questionnaire, the probability of disclosure in the 1/3 to 1/2 of the questionnaire and the last 1/2 of the questionnaire increased by 26.34% and 18.9%, respectively ( $F_{246}^2=48.37$ ,  $p<0.0001$ ). In addition, compared to questions low in sensitivity, the

probability of disclosure decreased by 13.04% for questions high in sensitivity ( $F_{124}^1=42.99$ ,  $p<0.0001$ ), which is in line with the literature.

With the rapport by question position interactions, Figure 5.1 represents predicted probability of disclosure based on estimated marginal means and Table 5.14 shows tests of simple effects (Winer, 1971). During the first 1/3 of the questionnaire, the probability of disclosure in high rapport interviews was 3.68% higher than that in low-rapport interviews ( $F_{246}^1=5.22$ ,  $p=0.02$ ). During the 1/3 to 1/2 of the questionnaire, the probability of disclosure in high rapport interviews was 7.93% lower than in low-rapport interviews ( $F_{246}^1=6.96$ ,  $p=0.01$ ). During the last 1/2 of the questionnaire, the probability of disclosure in high rapport interviews was 3.35% higher than in low-rapport interviews ( $F_{246}^1=1.98$ ,  $p=0.16$ ). When rapport was high, compared with the first 1/3 of the questionnaire, the probability of disclosure in the 1/3-1/2 of the questionnaire and the last 1/2 of the questionnaire increased by 20.49% and 18.64%, respectively ( $F_{246}^2=19.01$ ,  $p<0.0001$ ). When rapport was low, compared with the first 1/3 of the questionnaire, the probability of disclosure in the 1/3-1/2 of the questionnaire and the last 1/2 of the questionnaire increased by 32.1% and 18.97%, respectively ( $F_{246}^2=78.68$ ,  $p<0.0001$ ).

Figure 5.1 Probability of Disclosure: Rapport by Question Position Interaction



**Table 5.14** Tests of simple effects for rapport by question position interaction

	F Value	Pr > F
<b>Rapport</b>		
High	19.01	<.0001
Low	78.68	<.0001
<b>Question Position</b>		
First 1/3	5.22	0.02
1/3-1/2	6.96	0.01
Last 1/2	1.98	0.16

With the question position by question sensitivity interaction, during the first 1/3 of the questionnaire, the probability of disclosure for questions high in sensitivity was 19.48% lower than that for questions low in sensitivity ( $F_{248}^1=18.16$ ,  $p<0.0001$ ). During the 1/3 -1/2 of the questionnaire, the probability of disclosure for questions high in sensitivity was 0.61% higher than that for questions low in sensitivity ( $F_{248}^1=0.07$ ,  $p=0.79$ ). During the last 1/2 of the questionnaire, the probability of disclosure for questions high in sensitivity was 7.33% lower than that for questions low in sensitivity ( $F_{248}^1=36.50$ ,  $p<0.0001$ ).

### 5.5 Respondent Debriefing Items

Three debriefing questions were given to respondents at the end of the CAPI or video-mediated interviews, along with the two rapport scales. Respondents were



asked how interesting they found the topics in the interview (1=not interesting at all and 5=extremely interesting), how much they enjoyed taking part in this interview (1=not enjoyed at all and 5=extremely enjoyed), and how comfortable were they with the interview (1=not comfortable at all and 5=extremely comfortable). I fitted three multinomial logistic regression models to examine respondent preference for mode and the effects of rapport on respondents' interviewing experience.

As Table 5.15 shows, the main effects of mode were marginally significant on the debriefing question assessing how much the respondent enjoyed taking part in the interview. When rapport was high, the estimated odds ratio of extremely enjoying the interview for video-mediated interviews relative to CAPI was 1.00 and when rapport was low, the estimated odds ratio was 0.47. The main effects of rapport were also significant for this item. With video-mediated interviews, the estimated odds ratio of extremely enjoying the interview for high rapport relative to low rapport interviews was 13.05 and with CAPI, the estimated odds ratio was 6.11. This seems to suggest that respondents enjoyed the interview more in the high rapport video-mediated interviews.

**Table 5.15** Parameter Estimates in the Multinomial Logistic Regression Models on Respondent Debriefing Questions

<b>Debriefing Question</b>	<b>Mode: Video-Mediated Interview</b>	<b>Rapport: High Rapport</b>	<b>Interaction: Video-Mediated Interview × High Rapport</b>
	<b>Estimate (SE)</b>	<b>Estimate (SE)</b>	<b>Estimate (SE)</b>
Found topics in the interview to be extremely interesting	0.07 (0.40)	0.59 (0.56)	0.67 (0.79)
Extremely enjoyed the interview	-0.76# (0.40)	1.81** (0.58)	0.76 (0.78)
Felt extremely comfortable with the interview	0.04 (0.40)	0.89 (0.55)	0.86 (0.82)

Note: Reference categories for predictors were: Mode (CAPI) and Rapport (Low)

#p<0.10; \*p<0.05; \*\*p<0.01

## *5.6 Summary and Discussion*

I compared video-mediated interviews with face-to-face interviews in a laboratory experiment to investigate: (1) whether rapport can be similarly established in video-mediated and CAPI, and (2) whether video-mediated interviews increase disclosure of moderately sensitive information to the same extent as CAPI. I hypothesized that: (1) rapport would be lower in video-mediated interviews than CAPI, and that (2) respondents in video-mediated interviews would be less disclosive of moderately sensitive information compared to CAPI. These two hypotheses were partially supported by the data. There was no significant difference in rapport ratings between video-mediated and CAPI interviews, suggesting no evidence that rapport is any better established in CAPI than video-mediated interviews. Compared with CAPI, higher disclosure of moderately sensitive information was found in video-mediated interviews, though the effects were only marginally significant. More interesting results were found on the effects of rapport by question position interactions on disclosure.

The results suggest that significantly more disclosure of moderately sensitive information was produced in high rapport interviews relative to low rapport interviews at the beginning of the survey. Compared with low rapport interviews, high rapport interviews also produced more disclosure at the end of the survey, though the effects were marginally significant ( $p=0.16$ ). However, it is puzzling that low-rapport interviews produced significantly more disclosure than high rapport interviews during the 1/3 to 1/2 of the questionnaire.

Questions on mental health, religion, and voting were asked in the 1/3 to 1/2 of the questionnaire. Respondents may become more comfortable in disclosing during

low rapport interviews if questions on these topics are highly sensitive. It may also have something to do with what happened during the interview. The respondent and the interviewer in a high rapport interview may develop a positive relationship very quickly and maintain that relationship over the course of the interaction. The effects of rapport on disclosure may be quite stable under this circumstance. It seems that high rapport not only elicited more disclosure of sensitive information at the beginning of an interview but also kept respondents motivated and successfully maintained the level of disclosure at a later stage of the interview (see Figure 5.1). The flow of interaction between the respondent and the interviewer in a low rapport interview, however, may be strained and limited during the course of the interaction. With low rapport interviews, Figure 5.1 shows a sharp reduction in disclosure of sensitive information for the latter half of the interview. This may be because respondents become fatigued and lose interest in the interview and therefore wanted to complete the interview as quickly as possible. In addition, there was not enough rapport to enhance respondents' efforts or motivate them to be more honest. However, the effects of topics and question position were confounded in the current study because the presentation of topics in the questionnaire was not randomized.

In order to explore the relationship between rapport, question position, and question sensitivity, I added the rapport by question position by question sensitivity interactions into the final model. The three-way interaction was not significant ( $\chi^2(3) = 2.87, p=0.21$ ). This may be due to the small sample size in the current study ( $N=125$ ). It is worth noting, however, that a pattern emerges in this three-way interaction (see Figure 5.2).

Figure 5.2 (1) Probability of Disclosure When Question Sensitivity is Low: Question Position by Rapport Interaction

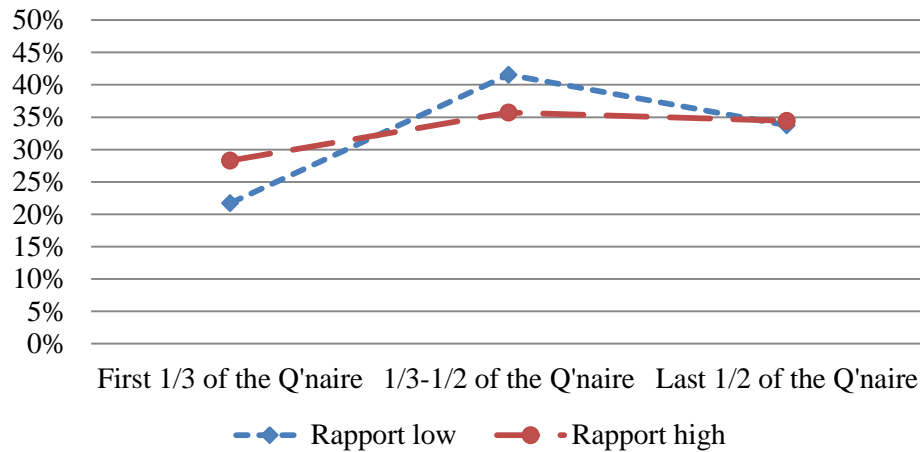


Figure 5.2 (2) Probability of Disclosure When Question Sensitivity is High: Question Position by Rapport Interaction

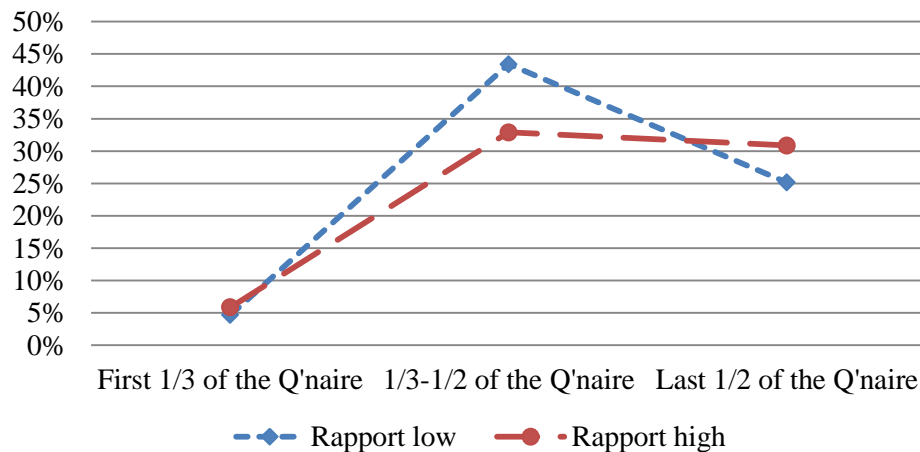


Table 5.16 presents the estimated marginal means and associated probability of disclosure for the rapport by question position by question sensitivity interactions. During the first 1/3 of the questionnaire, with questions low in sensitivity, the probability of disclosure with high rapport interviews was 6.59% higher than that with low rapport interviews; whereas with questions high in sensitivity, the probability of disclosure with high rapport interviews was 1.17% higher than that with low rapport interviews. This seems to suggest that rapport improves disclosure at the beginning of the interview when questions are low in sensitivity. During the last 1/2 of the

questionnaire, with questions low in sensitivity, the probability of disclosure with high rapport interviews was 0.68% higher than that with low rapport interviews; whereas with questions high in sensitivity, the probability of disclosure with high rapport interviews was 5.7% higher than that with low rapport interviews. As Figure 5.3 shows, when rapport was high, it gradually improved disclosure for questions high in sensitivity and successfully maintained the level of disclosure from the middle to the end of the survey. Overall, it seems to suggest that: (1) rapport improves disclosure of questions low in sensitivity at the beginning of an interview, and (2) rapport improves and maintains the level of disclosure for questions high in sensitivity during a later stage of the interview.

**Table 5.16** Estimated Marginal Means and Associated Probability of Disclosure for Rapport by Question Position by Question Sensitivity Interactions

<b>Question Sensitivity</b>	<b>Rapport</b>	<b>Question Position</b>	<b>Estimate</b>	<b>SE</b>	<b>Probability of Disclosure (%)</b>
High	High	First 1/3	-2.78	0.52	5.86
High	High	1/3-1/2	-0.71	0.15	32.89
High	High	Last 1/2	-0.81	0.12	30.86
High	Low	First 1/3	-3.01	0.34	4.69
High	Low	1/3-1/2	-0.26	0.09	43.43
High	Low	Last 1/2	-1.09	0.08	25.16
Low	High	First 1/3	-0.93	0.13	28.3
Low	High	1/3-1/2	-0.59	0.14	35.71
Low	High	Last 1/2	-0.65	0.12	34.41
Low	Low	First 1/3	-1.28	0.08	21.71
Low	Low	1/3-1/2	-0.34	0.08	41.53
Low	Low	Last 1/2	-0.68	0.07	33.73

## Chapter 6 Influence of Prior Respondent–Interviewer

### Interaction on Disclosure in ACASI

This chapter presents the results of the ACASI study to investigate whether the interviewer–respondent interaction in the preceding module (CAPI or video-mediated interviews) had an effect on disclosure of highly sensitive information in a subsequent ACASI module. First, I tested the research hypotheses on responses to individual survey questions. Next, I pooled all questions to examine the pattern of results across the ACASI module. Then, I compared the results between CAPI/video-mediated interviews and ACASI on disclosure. Finally, I examined responses to the ACASI respondent debriefing questions.

Forty-three highly sensitive questions were selected for use in the ACASI module. The mean sensitivity rating for questions used in the ACASI module was 3.78 ( $SD = 0.22$ ). The 43 highly sensitive questions were divided into three categories—Set A with 11 question, Set B with 11 questions, and Set C with 21 questions. The division of questions into Set A and Set B took into consideration both topics and question sensitivity. However, a completely balanced selection of topics and question sensitivity was difficult to achieve. Table 6.1 presents the topic and sensitivity ratings for each question used in Set A and Set B. The mean sensitivity ratings for Set A and Set B were 3.84 and 3.81, respectively.

**Table 6.1** Mean sensitivity ratings of survey questions used in the questionnaire (version 1 and version 2)

Questionnaire Version 1 (Set A and Set C Questions Used in ACASI)				Questionnaire Version 2 (Set B and Set C Questions Used in ACASI)			
Question Position	Topic	Mean	SD	Question Position	Topic	Mean	SD
Q4	Alcohol Consumption	3.77	0.93	Q3	Alcohol Consumption	4	0.95
Q9	Use of Tobacco Products	3.85	0.99	Q9	Use of Tobacco Products	3.58	1
Q10	Non-medical Use of Prescription Drugs	3.67	1.15	Q10	Non-medical Use of Prescription Drugs	4	1.18
Q11	Non-medical Use of Prescription Drugs	4.09	0.3	Q20	Sexual Behavior	3.55	1.21
Q19	Sexual Behavior	3.58	1.08	Q21	Sexual Behavior	3.75	1.22
Q23	Sexual Behavior	4.25	0.62	Q23	Sexual Behavior	3.91	0.7
Q26	Sexual Behavior	4	1.1	Q26	Sexual Behavior	3.92	1.31
<b><u>Q28</u></b>	<b><u>Mental Health</u></b>	<b><u>3.58</u></b>	<b><u>0.79</u></b>	Q27	Internet Usage	4.17	0.83
<b><u>Q29</u></b>	<b><u>Mental Health</u></b>	<b><u>3.75</u></b>	<b><u>0.87</u></b>	<b><u>Q29</u></b>	<b><u>Mental Health</u></b>	<b><u>3.62</u></b>	<b><u>1.04</u></b>
<b><u>Q30</u></b>	<b><u>Weight (Open-Ended)</u></b>	<b><u>4.08</u></b>	<b><u>1.31</u></b>	<b><u>Q30</u></b>	<b><u>Weight (Closed)</u></b>	<b><u>3.73</u></b>	<b><u>1.35</u></b>
<b><u>Q31</u></b>	<b><u>Charity Giving</u></b>	<b><u>3.58</u></b>	<b><u>1.38</u></b>	<b><u>Q31</u></b>	<b><u>Lawbreaking Behavior</u></b>	<b><u>3.67</u></b>	<b><u>1.37</u></b>
<b>Mean Sensitivity Rating</b>		3.84				3.81	

Note: Set A questions were used in the CAPI/video-mediated interviews of questionnaire version 2; Set B questions were used in the CAPI/video-mediated interviews of questionnaire version 1; the bold italic underlined questions were provided in the last 1/6 or 1/7 of the questionnaire depending on the questionnaire version

### 6.1 Analysis on Responses to Individual Survey Questions

In the ACASI study, I manipulated the vocal similarity used in the ACASI audio file. With the same voice condition, a recording of the same female interviewer in the preceding module (CAPI or video-mediated interview) reading the question

(both question stem and response options) was used in the subsequent ACASI module. With the different voice condition, a female voice that was different from that of the interviewer in the preceding module (CAPI or video-mediated interview) was used in the ACASI audio file. Vocal similarity was an experimental variable, whereas rapport in the preceding module was based on observational data.

In order to test the hypotheses, I included vocal similarity, rapport in the preceding module, and the vocal similarity by rapport interaction in the analysis of responses to individual questions. I used logistic regression for the 16 questions which required yes/no responses; ordinal logistic regression for the seven questions requiring selection from an ordered response scale (e.g. never, 1-2 times, 3-5 times, More than 5 times); and multinomial logistic regression for the two questions requiring a choice from an unordered response scale.

When the outcome variable was dichotomous or binary, the logistic regression model was specified as:

$$\text{logit}(\pi(x)) = \ln\left(\frac{\pi(x)}{1-\pi(x)}\right) = \beta_0 + \beta_1\text{Voice} + \beta_2\text{Rapport} + \beta_3\text{Voice} \times \text{Rapport}$$

where  $\ln\left(\frac{\pi(x)}{1-\pi(x)}\right)$  is the log-odds of disclosure of sensitive information relative to no disclosure;  $\beta_0$  represents the estimated intercept,  $\beta_1$  represents the contrast in log-odds between the different voice and same voice conditions for prior low-rapport interviews (the reference level for rapport) and is combined with the parameter  $\beta_3$  for the (different voice  $\times$  high rapport) product term to define the same contrast in log-odds for prior high rapport interviews.  $\beta_2$  represents the contrast in log-odds between prior high and low rapport interviews for the same voice condition (the reference level



for vocal similarity) and is combined with the parameter  $\beta_3$  for the (different voice  $\times$  high rapport) product term to define the same contrast in log-odds for the different voice condition.

When the outcome variable is an ordinal scale, the cumulative logit regression model was specified as follows:

$$\ln \left[ \frac{\Pr(y \leq k | x)}{\Pr(y \leq k | x)} \right] = \ln \left[ \frac{\Pr(y = 1 | x) + \dots + \Pr(y = k | x)}{\Pr(y = k + 1 | x) + \dots + \Pr(y = K | x)} \right] =$$

$$= \beta_{0(k)} - (\beta_1 \text{Voice} + \beta_2 \text{Rapport} + \beta_3 \text{Voice} \times \text{Rapport})$$

For an ordinal variable with K categories, K-1 cumulative logit functions are defined. Each cumulative logit function includes a unique intercept  $\beta_{0(k)}$  but all share a common set of three regression parameters.

When the outcome variable was a nominal scale, the multinomial logit regression was specified as follows, assuming that the categories of the outcome variable are coded as 0, 1, or 2:

$$\ln \left[ \frac{\Pr(y = 1 | x)}{\Pr(y = 0 | x)} \right] = \beta_{10} + \beta_{11} \text{Voice} + \beta_{12} \text{Rapport} + \beta_{13} \text{Voice} \times \text{Rapport}$$

and

$$\ln \left[ \frac{\Pr(y = 2 | x)}{\Pr(y = 0 | x)} \right] = \beta_{20} + \beta_{21} \text{Voice} + \beta_{22} \text{Rapport} + \beta_{23} \text{Voice} \times \text{Rapport}$$

Table 6.2 presents estimated logistic regression coefficients for individual questions with marginally significant or significant vocal similarity or rapport effects on disclosure of highly sensitive information in the ACASI module. As mentioned

earlier, when an independent variable is involved in an interaction there is no single odds ratio estimate for it. Instead, the odds ratio of that variable depends on the levels of the interacting variable. Table 6.3 presents estimated ratio of odds for vocal similarity and rapport taking into account the vocal similarity by rapport interaction for models given in Table 6.2. Appendix E presents estimated logistic regression coefficients for vocal similarity, rapport, and the vocal similarity by rapport interaction on all individual questions.

**Table 6.2** Individual questions showing marginally significant or significant vocal similarity or rapport effects on disclosure of highly sensitive information in the ACASI module

		<b>ACASI Voice: Different</b>	<b>Rapport in Preceding Module: High rapport</b>	<b>Interaction: Different Voice × High rapport</b>
<b>Model Type</b>	<b>Survey Question</b>	<b>Estimate (SE)</b>	<b>Estimate (SE)</b>	<b>Estimate (SE)</b>
Logistic Regression	Ever had anal sex	-0.01 (0.42)	0.87 <sup>^</sup> (0.62)	-0.91 (0.84)
	Ever performed oral sex on a person of the same sex	0.51 (0.68)	1.66* (0.76)	-1.07 (1.04)
	Weight++	-0.15 (0.65)	1.18 <sup>^</sup> (0.89)	-1.93 <sup>^</sup> (1.48)
	Overweight+	1.47* (0.66)	1.49# (0.87)	-1.42 (1.17)
	Non-medical use of prescription tranquilizer	0.05 (1.45)	1.95 <sup>^</sup> (1.31)	-0.45 (1.84)
	Has a person of the same sex ever performed oral sex on you	0.68 (0.81)	1.34 <sup>^</sup> (0.96)	-1.15 (1.28)
Ordinal Logistic Regression	Felt hopeless during the past 30 days	-0.24 (0.47)	-1.08 <sup>^</sup> (0.83)	0.49 (1.10)
Multinomial Logistic Regression	Felt that everything was an effort when at worst emotionally in the past 12 months	-0.86 <sup>^</sup> (0.54)	-0.58 (0.78)	-0.17 (1.14)

Note: reference categories for predictors are vocal similarity (same) and rapport (low)

+ Multinomial variable recorded into binary due to zero or small cell sizes

++The continuous variable was not normally distributed and therefore recorded as a multinomial or binary variable

<sup>^</sup>p < 0.20 #p < 0.10, \*p < 0.05

**Table 6.3** Estimated odds ratio for individual questions with marginally significant or significant vocal similarity or rapport effects on disclosure of highly sensitive information in the ACASI module

	Different ACASI Voice vs. Same ACASI Voice		High Rapport vs. Low Rapport	
	High Rapport	Low Rapport	Different Voice	Same Voice
Survey Question	Odds Ratio (CI)	Odds Ratio (CI)	Odds Ratio (CI)	Odds Ratio (CI)
Ever had anal sex	0.40 (0.10-1.66)	0.99 (0.43-2.28)	0.96 (0.32-2.89)	2.38 (0.70-8.07)
Ever performed oral sex on a person of the same sex	0.57 (0.12-2.68)	1.66 (0.44-6.33)	1.81 (0.44-7.38)	5.25 (1.19-23.17)
Weight++	0.13 (0.01-1.67)	0.86 (0.24-3.09)	0.47 (0.05-4.77)	3.24 (0.57-18.39)
Overweight+	1.05 (0.16-6.92)	4.33 (1.20-15.69)	1.08 (0.24-4.88)	4.44 (0.80-24.61)
Non-medical use of prescription tranquilizer	0.67 (0.07-6.11)	1.05 (0.06-17.95)	4.44 (0.36-55.58)	7.00 (0.54-91.11)
Has a person of the same sex ever performed oral sex on you	0.63 (0.09-4.40)	1.98 (0.41-9.59)	1.20 (0.23-6.34)	3.80 (0.58-24.88)
Felt hopeless during the past 30 days	1.29 (0.18-9.13)	0.79 (0.32-1.96)	0.55 (0.13-2.30)	0.34 (0.07-1.73)
Felt that everything was an effort when at worst emotionally in the past 12 months	0.36 (0.05-2.59)	0.42 (0.15-1.21)	0.47 (0.09-2.43)	0.56 (0.12-2.58)

Note: reference categories for predictors are vocal similarity (same) and rapport (low)

CI presents the confidence interval of the estimated odds ratio

+ Multinomial variable recorded into binary due to zero or small cell sizes

++The continuous variable was not normally distributed and therefore recorded as a multinomial or binary variable

The effects of vocal similarity were significant on one question ( $p < 0.05$ ). The estimated odds of stating overweight for different voices relative to the same voice condition was 1.05 with prior high-rapport interviews and 4.33 with prior low-rapport interviews. The effects of vocal similarity were marginally significant on one question ( $p < 0.20$ ). The estimated odds of admitting to ever having felt everything was an effort in the past 12 months when one was the most emotionally stressed for different

voices relative to the same voice condition was 0.36 with prior high-rapport interviews and 0.42 with prior low-rapport interviews.

The effects of rapport in the preceding module were significant on one question ( $p < 0.05$ ). The estimated odds of admitting to having ever performed oral sex on a person of the same sex for prior high-rapport interviews relative to prior low-rapport interviews was 1.81 with the different voice condition and 5.25 with the same voice condition.

The effects of rapport in the preceding module were marginally significant on six questions ( $p < 0.10$  or  $p < 0.20$ ). The estimated odds of admitting to ever having had anal sex for prior high-rapport interviews relative to prior low-rapport interviews was 0.96 with the different voice condition and 2.38 with the same voice condition. The estimated odds of admitting weight above sample medium for prior high-rapport interviews relative to prior low-rapport interviews was 0.47 with the different voice condition and 3.24 with the same voice condition. The estimated odds of stating overweight for prior high-rapport interviews relative to prior low-rapport interviews was 1.08 with the different voice condition and 4.44 with the same voice condition. The estimated odds of admitting to non-medical use of any prescription tranquilizers for prior high-rapport interviews relative to prior low-rapport interviews was 4.44 with the different voice condition and 7.00 with the same voice condition. The estimated odds of admitting that a person of the same sex ever performed oral sex on oneself for prior high-rapport interviews relative to prior low-rapport interviews was 1.20 with the different voice condition and 3.80 with the same voice condition. In addition, the estimated odds of having felt hopeless in the past 30 days for prior high-rapport interviews relative to prior low-rapport interviews was 0.55 with the different voice condition and 0.34 with the same voice condition. Compared prior high-rapport

with prior low-rapport interviews, when the ACASI voice was very similar to the interviewer's voice in the preceding module, the estimated odds of disclosure were higher for six out of the eight questions, which was in the opposite direction to the hypothesis.

## *6.2 Multilevel Multinomial Logistic Regression Analysis on Disclosure in ACASI*

To boost power and examine the pattern of results across the ACASI questionnaire, I pooled all questions to examine the probability of disclosure of highly sensitive information. I fitted random-effects multinomial logistic regression models that treated respondents as clustered by interviewers as well as the data as clustered by respondents; they estimated the probability of disclosure taking into account all the questions in the ACASI module. As mentioned earlier, 43 highly sensitive questions were divided into three categories—Set A with 11 question, Set B with 11 questions, and Set C with 21 questions. If respondents were given Set A questions in the preceding module (CAPI or video-mediated interviews), they were asked Set B and Set C questions in the subsequent ACASI module; whereas, if respondents were given Set B question in the preceding module, they were asked Set A and Set C questions in the ACASI module.

I first examined the effects of experimental variables (mode in the preceding module and vocal similarity) on disclosure with the Set C questions, which were given to the 125 respondents. I then added rapport in the preceding module into the model with Set C questions. Rapport in the preceding module was rated by respondents at the end of the CAPI or video-mediated interviews, which was not an experimental variable but rather observational data. Finally, I added the vocal

similarity by rapport interaction into the module to test the associated hypothesis with the Set C questions.

Next, I investigated the effects of experimental variables (mode in the preceding module, vocal similarity, and questionnaire version) on disclosure with the Set A, B, and C questions. I then added rapport in the preceding module into the model with Set A, B, and C questions. Finally, I added the vocal similarity by rapport interactions into the model with the Set A, B, and C questions. All models were fitted using the Laplace estimation method.

#### 6.2.1 Multilevel Multinomial Logistic Regressions with Set C Questions on Disclosure in ACASI

##### 6.2.1.1 The Effects of Mode and Vocal Similarity on Disclosure with Set C Questions

I first fitted a random-effects multilevel multinomial logistic regression model to estimate the probability of disclosure with two experimental variables—mode in the preceding module and vocal similarity. I also included random effects associated with interviewer intercepts as well as random effects associated with respondent intercepts.

After fitting the model, I first tested whether the random effects associated with interviewer intercepts can be omitted from the full model. The test results showed that the variance components of the random effects associated with interviewers were estimated to be zero. I therefore removed the random effects associated with interviewer intercepts from the model. I then tested whether the random effects associated with respondent intercepts can be omitted from the reduced model. Variances of random intercepts were tested against zero using an appropriate

likelihood ratio test, based on maximum likelihood estimation. The test results rejected the null hypothesis and therefore I retained the random effects associated with respondents in the model. The model was specified as follows:

$$\log\left[\frac{p_{ij}}{1-p_{ij}}\right] = \beta_0 + \beta_1 Mode_j + \beta_2 Voice_j + u_j + \varepsilon_{ij}$$

where  $\log\left[\frac{p_{ij}}{1-p_{ij}}\right]$  represents the logit of the probability of disclosure for survey

response  $i$  nested within respondent  $j$ ;  $\beta_0$  through  $\beta_2$  represents the fixed intercept and the fixed effects of the covariates (mode in the preceding module and vocal similarity);  $u_j$  is the random effect associated with the intercept for respondent  $j$ ; and  $\varepsilon_{ij}$  represents the residual. I assumed that the random effects,  $u_j$ , associated with respondents, and the residuals,  $\varepsilon_{ij}$ , are all mutually independent.

The distribution of the random effects associated with the respondents is written as:

$$u_j \sim N(0, \sigma_{\text{int:respondent}}^2)$$

where  $\sigma_{\text{int:respondent}}^2$  represents the variance of the respondent-specific random intercepts.

The distribution of the residuals associated with the response-level observations is

$$\varepsilon_{ij} \sim N(0, \sigma^2)$$

where  $\sigma^2$  represents the residual variance.

The estimated residual variance of the random effects associated with the intercept for respondents was 0.14. The residual intraclass correlation coefficient was calculated as:

$$ICC = \frac{\sigma_{u_j}^2}{\sigma_{u_j}^2 + \pi^2/3} = 0.04$$

Table 6.4 presents estimates of the parameters in the multilevel multinomial logistic regression model including two experimental variables (mode in the preceding module and vocal similarity) and the random effects associated with respondent intercepts. As Table 6.4 shows, neither mode in the preceding module nor vocal similarity has a significant effect on disclosure when controlling for the other predictor. Table 6.5 presents the estimated marginal means and associated probability of disclosure. Compared with CAPI, the probability of disclosure was slightly higher if the preceding module was a video-mediated interview. Compared with the same voice condition, the probability of disclosure was 2.4% higher with the different voice condition.

**Table 6.4** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure in ACASI with mode in the preceding module, vocal similarity, and random effects associated with respondent intercepts on Set C questions

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-0.49	0.12	-4.16***	122
Mode	Video-mediated Interview	0.03	0.14	0.21	122
Vocal Similarity	Different Voice	0.10	0.14	0.74	122
Covariance Parameter		Estimate	SE		
$\sigma_{\text{int:respondent}}^2$		0.14	0.08		

Note: reference categories for predictors are mode (CAPI) and vocal similarity (same)

$\sigma_{\text{int:respondent}}^2$  is the random effects associated with the respondent intercepts

\*\*\*p < 0.0001



**Table 6.5** Estimated marginal means and associated probability of disclosure for mode in the preceding module and vocal similarity for the model provided in Table 6.4

Parameter	Estimate	SE	Probability of Disclosure (%)
<b>Mode</b>			
Video-mediated Interview	-0.41	0.10	39.79
CAPI	-0.44	0.10	39.12
<b>Vocal Similarity</b>			
Different Voice	-0.38	0.10	40.66
Same Voice	-0.48	0.10	38.26

#### 6.2.1.2 The Effects of Mode, Vocal Similarity, and Rapport on Disclosure with Set C Questions

Next, I fitted a multilevel multinomial logistic regression on disclosure in ACASI with two experimental variables—mode in the preceding module and vocal similarity—and one variable based on observational data—rapport in the preceding module, as well as random effects associated with interviewer intercepts and random effects associated with respondent intercepts. With appropriate likelihood ratio tests, the random effects associated with interviewer intercepts were omitted because the variance components were estimated to be zero, whereas the random effects associated with respondent intercepts were retained. The model was specified as follows:

$$\log\left[\frac{p_{ij}}{1-p_{ij}}\right] = \beta_0 + \beta_1 \text{Mode}_j + \beta_2 \text{Voice}_j + \beta_3 \text{Rapport}_j + u_j + \varepsilon_{ij}$$

$$u_j \sim N(0, \sigma_{\text{int:respondent}}^2)$$

$$\varepsilon_{ij} \sim N(0, \sigma^2)$$

where  $\log\left[\frac{p_{ij}}{1-p_{ij}}\right]$  represents the logit of the probability of disclosure for survey

response  $i$  nested within respondent  $j$ ;  $\beta_0$  through  $\beta_3$  represent the fixed intercept and the fixed effects of the covariates (mode in the preceding module, vocal similarity, and rapport in the preceding module);  $u_j$  is the random effect associated with the intercept for respondent  $j$ ; and  $\varepsilon_{ij}$  represents the residual. I assumed that the random effects,  $u_j$ , associated with respondents, and the residuals,  $\varepsilon_{ij}$ , are all mutually independent. The residual intraclass correlation coefficient was 0.04.

Table 6.6 presents estimates of the parameters in the multilevel multinomial logistic regression model including three predictors (mode in the preceding module, vocal similarity, and rapport in the preceding module) and the random effects associated with respondent intercepts. As Table 6.6 shows, only rapport in the preceding module has marginally significant effects on disclosure when controlling for all of the other predictors. Table 6.7 presents the estimated marginal means and associated probability of disclosure. Compared with CAPI, the probability of disclosure was slightly higher if the preceding module was a video-mediated interview. Compared with the same voice condition, the probability of disclosure was 2.19% higher with the different voice condition. Compared with prior low-rapport interviews, the probability of disclosure was 6.09% higher with prior high-rapport interviews, suggesting carryover effects of rapport in the preceding module on disclosure in the subsequent ACASI module. It seems to suggest that rapport improves reporting of highly sensitive information.

**Table 6.6** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure in ACASI with mode in the preceding module, vocal similarity, rapport in the preceding module, and random effects associated with respondent intercepts on Set C questions

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-0.56	0.12	-4.51***	121
Mode	Video-mediated Interview	0.03	0.13	0.24	121
Vocal Similarity	Different Voice	0.09	0.13	0.68	121
Rapport	High	0.25	0.15	1.69#	121
Covariance Parameter		Estimate	SE		
$\sigma_{\text{int:respondent}}^2$		0.12	0.07		

Note: reference categories for predictors are mode (CAPI), vocal similarity (same), and rapport (high)

$\sigma_{\text{int:respondent}}^2$  refers to random effects associated with respondent intercepts

#p < 0.10, \*\*\*p < 0.001

**Table 6.7** Estimated marginal means and associated probability of disclosure for mode in the preceding module, vocal similarity, and rapport in the preceding module for model provided in Table 6.6

Parameter	Estimate	SE	Probability of Disclosure (%)
<b>Mode</b>			
Video-mediated Interview	-0.35	0.10	41.23
CAPI	-0.39	0.10	40.45
<b>Vocal Similarity</b>			
Different Voice	-0.33	0.10	41.94
Same Voice	-0.42	0.10	39.75
<b>Rapport</b>			
High	-0.24	0.13	43.92
Low	-0.50	0.08	37.83

### 6.2.1.3. The Effects of Mode, Vocal Similarity, Rapport, and the Vocal Similarity by Rapport Interaction on Disclosure with Set C Questions

Additionally, I fitted a multilevel multinomial logistic regression on disclosure with two experimental variables (mode in the preceding module and vocal similarity), one variable based on observational data (rapport in the preceding module), and one interaction (vocal similarity by rapport). I also included the random effects associated

with interviewer intercepts as well as the random effects associated with respondent intercepts to the model. With appropriate likelihood ratio tests, the random effects associated with interviewer intercepts were omitted because the variance components were estimated to be zero, whereas the random effects associated with respondent intercepts were retained. The model was specified as follows:

$$\log\left[\frac{P_{ij}}{1 - P_{ij}}\right] = \beta_0 + \beta_1 Mode_j + \beta_2 Voice_j + \beta_3 Rapport_j + \beta_4 Voice_j \times Rapport_j + u_j + \varepsilon_{ij}$$

$$u_j \sim N(0, \sigma_{\text{int:respondent}}^2)$$

$$\varepsilon_{ij} \sim N(0, \sigma^2)$$

where  $\log\left[\frac{P_{ij}}{1 - P_{ij}}\right]$  represents the logit of the probability of disclosure for survey

response  $i$  nested within respondent  $j$ ;  $\beta_0$  through  $\beta_4$  represent the fixed intercept and the fixed effects of the covariates and the interaction (mode in the preceding module, vocal similarity, rapport in the preceding module, and the vocal similarity by rapport interaction);  $u_j$  is the random effect associated with the intercept for respondent  $j$ ; and  $\varepsilon_{ij}$  represents the residual. I assumed that the random effects,  $u_j$ , associated with respondents, and the residuals,  $\varepsilon_{ij}$ , are all mutually independent. The residual intraclass correlation coefficient was 0.04.

Table 6.8 presents estimates of the parameters in the multilevel multinomial logistic regression model including two experimental variables (mode in the preceding module and vocal similarity), rapport in the preceding module, the vocal similarity by rapport interaction as well as the random effects associated with respondent intercepts. As Table 6.8 shows, none of the predictors has significant

effects on disclosure when controlling for all of the other predictors. Table 6.9 presents the estimated marginal means and associated probability of disclosure. Compared with CAPI, the probability of disclosure was slightly higher if the preceding module was a video-mediated interview. Compared with the same voice condition, the probability of disclosure was 2.06% higher with the different voice condition. Compared with prior low-rapport interviews, the probability of disclosure was 6.1% higher with prior high-rapport interviews, suggesting carryover effects of rapport in the preceding module on disclosure in the subsequent ACASI module though the effects were not statistically significant ( $p=0.23$ ). With the same voice condition, the probability of disclosure for prior high-rapport interviews and prior low-rapport interviews were 43.04% and 36.69%, respectively. With the different voice condition, the probability of disclosure for prior high-rapport interviews and prior low-rapport interviews were 44.83% and 38.99%, respectively.

**Table 6.8** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure in ACASI with mode in the preceding module, vocal similarity, rapport in the preceding module, the vocal similarity by rapport interaction, and random effects associated with respondent intercepts on Set C questions

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-0.56	0.13	-4.25***	120
Mode	Video-mediated Interview	0.03	0.13	0.25	120
Vocal Similarity	Different Voice	0.10	0.16	0.62	120
Rapport	High	0.27	0.22	1.21	120
Vocal Similarity × Rapport	Different Voice × High Rapport	-0.03	0.30	-0.08	120
<b>Covariance Parameter</b>		<b>Estimate</b>	<b>SE</b>		
		0.12	0.07		

Note: reference categories for predictors are mode (CAPI), vocal similarity (same), and rapport (high)

$\sigma_{int:respondent}^2$  refers to random effects associated with respondent intercepts

\*\*\* $p < 0.0001$

**Table 6.9** Estimated marginal means and associated probability of disclosure for mode in the preceding module, vocal similarity, rapport in the preceding module, and the vocal similarity by rapport interaction for the model provided in Table 6.8

Parameter	Estimate	SE	Probability of Disclosure (%)
<b>Mode</b>			
Video-mediated Interview	-0.35	0.10	41.25
CAPI	-0.39	0.10	40.45
<b>Vocal Similarity</b>			
Different Voice	-0.33	0.10	41.88
Same Voice	-0.41	0.11	39.82
<b>Rapport</b>			
High	-0.24	0.13	43.93
Low	-0.50	0.08	37.83
<b>Vocal Similarity × Rapport</b>			
Different Voice × High Rapport	-0.21	0.17	44.83
Different Voice × Low Rapport	-0.45	0.11	38.99
Same Voice × High Rapport	-0.28	0.19	43.04
Same Voice × Low Rapport	-0.55	0.11	36.69

## 6.2.2 Multilevel Multinomial Logistic Regressions with Set A, B, and C Questions on Disclosure in ACASI

### 6.2.2.1 The Effect of Mode, Vocal Similarity, and Questionnaire Version on Disclosure with Set A, B, and C Questions

Next, I investigated the effects of experimental variables on disclosure in the ACASI module with Set A, B, and C questions. I first fitted a random-effects multilevel multinomial logistic regression model to estimate the probability of disclosure in ACASI with three experimental variables—mode in the preceding module, vocal similarity, and the questionnaire version. This model also included the random effects associated with interviewer intercepts as well as the random effects associated with respondent intercepts.

After fitting the model, I first tested whether the random effects associated with interviewer intercepts could be omitted from the full model. The test results showed that the variance components of the random effects associated with

interviewers was estimated to be zero. I therefore removed the random effects associated with interviewer intercepts from the full model. I then tested whether the random effects associated with respondent intercepts could be omitted from the reduced model. Variances of random intercepts were tested against zero using appropriate likelihood ratio test, based on maximum likelihood estimation. The test results rejected the null hypothesis and therefore I retained the random effects associated with respondents in the model. The model was specified as follows:

$$\log\left[\frac{p_{ij}}{1-p_{ij}}\right] = \beta_0 + \beta_1 Mode_j + \beta_2 Voice_j + \beta_3 Version_j + u_j + \varepsilon_{ij}$$

$$u_j \sim N(0, \sigma_{\text{int:respondent}}^2)$$

$$\varepsilon_{ij} \sim N(0, \sigma^2)$$

where  $\log\left[\frac{p_{ij}}{1-p_{ij}}\right]$  represents the logit of the probability of disclosure of highly

sensitive information for survey response  $i$  nested within respondent  $j$ ;  $\beta_0$  through

$\beta_3$  represent the fixed intercept and the fixed effects of the covariates (mode in the

preceding module, vocal similarity, and questionnaire version);  $u_j$  is the random effect

associated with the intercept for respondent  $j$ ; and  $\varepsilon_{ij}$  represents the residual. I

assumed that the random effects,  $u_j$ , associated with respondents, and the residuals,  $\varepsilon_{ij}$ ,

are all mutually independent. The estimated residual variance of the random effects

associated with the intercept for respondents was 0.16. The residual intraclass

correlation coefficient was 0.05.

Table 6.10 presents estimates of the parameters in the multilevel multinomial logistic regression model including the three experimental variables (mode in the preceding module, vocal similarity, and questionnaire version) and the random effects associated with respondent intercepts. Table 6.10 shows that none of the predictors has significant effects on disclosure when controlling for all of the other predictors. Table 6.11 presents the estimated marginal means for all predictors and associated probability of disclosure. Compared with CAPI, the probability of disclosure was slightly lower when video-mediated interviews were used in the preceding module. Compared with the same voice condition, the probability of disclosure in the different voice condition only increased by 0.42%. Compared with questionnaire version 1, the probability of disclosure was slightly lower with questionnaire version 2.

**Table 6.10** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure in ACASI with mode in the preceding module, vocal similarity, questionnaire version, and random effects associated with respondent intercepts on Set A, B, and C questions

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-0.3811	0.1103	-3.45***	121
Mode	Video-mediated Interview	-0.07519	0.1125	-0.67	121
Vocal Similarity	Different Voice	0.01736	0.1126	0.15	121
Questionnaire Version	Version 2	-0.02598	0.1128	-0.23	121
Covariance Parameter		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.16	0.05		

Note: reference categories for predictors are mode (CAPI), vocal similarity (same), and questionnaire version (version 2)

$\sigma^2_{\text{int:respondent}}$  refers to random effects associated with respondent intercepts

\*\*\*p < 0.0001



**Table 6.11** Estimated marginal means and associated probability of disclosure for mode in the preceding module, vocal similarity, and questionnaire version for the model provided in Table 6.10

Parameter	Estimate	SE	Probability of Disclosure (%)
<b>Mode in Preceding Module</b>			
Video-mediated Interviews	-0.46	0.08	38.68
CAPI	-0.39	0.08	40.48
<b>Vocal Similarity</b>			
Different Voice	-0.41	0.08	39.79
Same Voice	-0.43	0.08	39.37
<b>Questionnaire Version</b>			
Version 2	-0.44	0.08	39.27
Version 1	-0.41	0.08	39.89

#### 6.2.2.2 The Effect of Mode, Vocal Similarity, Questionnaire Version, and Rapport on Disclosure with Set A, B, and C Questions

Next, I fitted a random-effects multilevel multinomial logistic regression model predicting disclosure in the ACASI module with three experimental variables (mode in the preceding module, vocal similarity, and questionnaire version) and one variable based on the observational data (rapport in the preceding module). I also included the random effects associated with interviewer intercepts and the random effects associated with respondent intercepts in the model. The random effects associated with interviewer intercepts were omitted because the variance components were estimated to be zero. The random effects associated with respondent intercepts were retained given the result of the appropriate likelihood ratio test. The model was specified as follows:

$$\log\left[\frac{p_{ij}}{1 - p_{ij}}\right] = \beta_0 + \beta_1 Mode_j + \beta_2 Voice_j + \beta_3 Version_j + \beta_4 Rapport_j + u_j + \varepsilon_{ij}$$

$$u_j \sim N(0, \sigma_{\text{int:respondent}}^2)$$

$$\varepsilon_{ij} \sim N(0, \sigma^2)$$

where  $\log\left[\frac{p_{ij}}{1-p_{ij}}\right]$  represents the logit of the probability of disclosure in ACASI for survey response  $i$  nested within respondent  $j$ ;  $\beta_0$  through  $\beta_4$  represent the fixed intercept and the fixed effects of the covariates (mode in the preceding module, vocal similarity, questionnaire version, and rapport in the preceding module);  $u_j$  is the random effect associated with the intercept for respondent  $j$ ; and  $\varepsilon_{ij}$  represents the residual. I assumed that the random effects,  $u_j$ , associated with respondents, and the residuals,  $\varepsilon_{ij}$ , are all mutually independent. The estimated residual variance of the random effects associated with the intercept for respondents was 0.16. The residual intraclass correlation coefficient was 0.05.

Table 6.12 presents estimates of the parameters in the multilevel multinomial logistic regression model including the three experimental variables (mode in the preceding module, vocal similarity, and questionnaire version), rapport in the preceding module, and the random effects associated with respondent intercepts. As Table 6.12 shows, rapport in the preceding module has marginally significant effects on disclosure when controlling for all of the other predictors. Table 6.13 presents the estimated marginal means for all predictors and associated probability of disclosure. The probability of disclosure for video-mediated interviews and CAPI were 39.77% and 41.47%, respectively. Compared with the same voice condition, the probability of disclosure in the different voice condition only increased by 0.25%. Compared with questionnaire version 1, the probability of disclosure in questionnaire version 2 decreased by 1.03%. Compared with prior low-rapport interviews, the probability of disclosure for the prior high-rapport interviews increased by 4.53%, suggesting the carryover effects of rapport in the preceding module on disclosure in the subsequent

ACASI module. It seems that respondents who experienced high rapport in the preceding module (CAPI or video-mediated interviews) were more likely to disclose highly sensitive information in the subsequent ACASI module, though the ACASI module was self-administered and the interviewer was not physically present.

**Table 6.12** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure in ACASI with mode in the preceding module, vocal similarity, questionnaire version, rapport in the preceding module, and random effects associated with respondent intercepts on Set A, B, and C questions

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-0.4226	0.1132	-3.73**	120
Mode	Video-mediated Interview	-0.07041	0.1118	-0.63	120
Vocal Similarity	Different Voice	0.01049	0.1119	0.09	120
Questionnaire Version	Version 2	-0.04243	0.1125	-0.38	120
Rapport	High	0.1878	0.1264	1.49^	120
Covariance Parameter		Estimate	SE		
$\sigma_{\text{int:respondent}}^2$		0.16	0.05		

Note: reference categories for predictors are mode (CAPI), vocal similarity (same), questionnaire version (version 2), and rapport (high)

$\sigma_{\text{int:respondent}}^2$  refers to random effects associated with respondent intercepts

^p < 0.20, \*\*p < 0.01

**Table 6.13** Estimated marginal means and associated probability of disclosure mode in the preceding module, vocal similarity, questionnaire version, and rapport in the preceding module for the model provided in Table 6.12

Parameter	Estimate	SE	Probability of Disclosure (%)
<b>Mode</b>			
Video-mediated Interview	-0.42	0.08	39.77
CAPI	-0.34	0.08	41.47
<b>Vocal Similarity</b>			
Different Voice	-0.37	0.08	40.74
Same Voice	-0.39	0.09	40.49
<b>Questionnaire Version</b>			
Version 2	-0.40	0.08	40.10
Version 1	-0.36	0.08	41.13
<b>Rapport</b>			
High	-0.29	0.11	42.90
Low	-0.47	0.07	38.37

### 6.2.2.3 The Effect of Mode, Vocal Similarity, Questionnaire Version, Rapport, and the Vocal Similarity by Rapport Interaction on Disclosure with Set A, B, and C Questions

In addition, I fitted a random-effects multilevel multinomial logistic regression model predicting disclosure in the ACASI module with three experimental variables (mode in the preceding module, vocal similarity, and questionnaire version), one variable based on the observational data (rapport in the preceding module), and one interaction (vocal similarity by rapport). The model also included random effects associated with interviewer intercepts as well as random effects associated with respondent intercepts. The random effects associated with interviewer intercepts were omitted from this model because the variance components were estimated to be zero. The random effects associated with respondent intercepts were retained given the result of the likelihood ratio test. The model was specified as follows:

$$\log\left[\frac{p_{ij}}{1-p_{ij}}\right] = \beta_0 + \beta_1 Mode_j + \beta_2 Voice_j + \beta_3 Version_j + \beta_4 Rapport_j + \beta_5 Voice_j \times Rapport_j + u_j + \varepsilon_{ij}$$

$$u_j \sim N(0, \sigma_{\text{int:respondent}}^2)$$

$$\varepsilon_{ij} \sim N(0, \sigma^2)$$

where  $\log\left[\frac{p_{ij}}{1-p_{ij}}\right]$  represents the logit of the probability of disclosure in ACASI for

survey response  $i$  nested within respondent  $j$ ;  $\beta_0$  through  $\beta_5$  represent the fixed

intercept and the fixed effects of the covariates and the interaction (mode in the

preceding module, vocal similarity, the questionnaire version, rapport in the preceding

module, and the vocal similarity by rapport interaction);  $u_j$  is the random effect associated with the intercept for respondent  $j$ ; and  $\varepsilon_{ij}$  represents the residual. I assumed that the random effects,  $u_j$ , associated with respondents, and the residuals,  $\varepsilon_{ij}$ , are all mutually independent. The estimated residual variance of the random effects associated with the intercept for respondents was 0.16. The residual intraclass correlation coefficient was 0.05.

Table 6.14 presents estimates of the parameters in the multilevel multinomial logistic regression model including the three experimental variables (mode in the preceding module, vocal similarity, and questionnaire version), rapport in the preceding module, and the vocal similarity by rapport interaction as well as the random effects associated with respondent intercepts. As Table 6.14 shows, rapport has marginally significant effects on disclosure in ACASI when controlling for all of the other predictors. Table 6.15 presents the estimated marginal means for all predictors and associated probability of disclosure. The probability of disclosure for video-mediated interviews and CAPI were 39.85% and 41.46%, respectively. Compared with the same voice condition, the probability of disclosure in the different voice condition only decreased by 0.27%. Compared with questionnaire version 1, the probability of disclosure in questionnaire version 2 decreased by 0.99%. Compared with prior low-rapport interviews, the probability of disclosure for the prior high-rapport interviews increased by 4.59%, suggesting carryover effects of rapport in the preceding module on disclosure in the subsequent ACASI module though the effects were only marginally significant. With the same voice condition, the probability of disclosure for prior high-rapport interviews and prior low-rapport interviews were 43.68% and 37.96%, respectively. With the different voice condition, the probability

of disclosure for prior high-rapport interviews and prior low-rapport interviews were 42.26% and 38.80%, respectively.

**Table 6.14** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure in ACASI with mode in the preceding module, vocal similarity, questionnaire version, rapport in the preceding module, the vocal similarity by rapport interaction, and random effects associated with respondent intercepts on Set A, B, and C questions

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-0.4375	0.1201	-3.64**	119
Mode	Video-mediated Interview	-0.06662	0.1122	-0.59	119
Vocal Similarity	Different Voice	0.03572	0.1309	0.27	119
Questionnaire Version	Version 2	-0.04110	0.1125	-0.37	119
Rapport	High	0.2371	0.1836	1.29^	119
Vocal Similarity × Rapport	Different Voice × High Rapport	-0.09364	0.2528	-0.37	119
Covariance Parameter		Estimate	SE		
$\sigma_{\text{int:respondent}}^2$		0.16	0.05		

Note: reference categories for predictors are mode (CAPI), vocal similarity (same), questionnaire version (version 2), and rapport (high)

$\sigma_{\text{int:respondent}}^2$  refers to random effects associated with respondent intercepts

^p < 0.20, \*\*p < 0.01

**Table 6.15** Estimated marginal means and associated probability of disclosure mode in the preceding module, vocal similarity, questionnaire version, rapport in the preceding module, the vocal similarity by rapport interaction for the model provided in Table 6.14.

Parameter	Estimate	SE	Probability of Disclosure (%)
<b>Mode</b>			
Video-mediated Interview	-0.41	0.08	39.85
CAPI	-0.35	0.08	41.46
<b>Vocal Similarity</b>			
Different Voice	-0.38	0.09	40.52
Same Voice	-0.37	0.09	40.79
<b>Questionnaire Version</b>			
Version 2	-0.40	0.09	40.16
Version 1	-0.36	0.08	41.15
<b>Rapport</b>			
High	-0.28	0.11	42.97
Low	-0.47	0.07	38.38
<b>Vocal Similarity × Rapport</b>			
Different Voice × High Rapport	-0.31	0.15	42.26
Different Voice × Low Rapport	-0.46	0.09	38.80
Same Voice × High Rapport	-0.25	0.16	43.68
Same Voice × Low Rapport	-0.49	0.09	37.96

### *6.3 CAPI or Video-mediated Interviews vs. ACASI on Disclosure of Highly Sensitive Information*

As mentioned earlier, 43 highly sensitive questions were divided into three categories—Set A with 11 question, Set B with 11 questions, and Set C with 21 questions. If respondents were given Set A questions in the preceding module (CAPI or video-mediated interviews), they were asked Set B and Set C questions in the subsequent ACASI module; whereas, if respondents were given Set B question in the preceding module, they were asked Set A and Set C questions in the ACASI module. This design allowed us to assess whether ACASI increases disclosure over the previous interview (CAPI or video-mediated interview).

Table 6.16 presents the percentage of reported sensitive behaviors between video-mediated interviews and ACASI. Responses to all questions were recoded into dichotomous or binary variables due to non-normal distribution, zero or small cell sizes expect for the open-ended question on weight. The percentage of reported sensitive behaviors was the same for ACASI and video-mediated interviews for four out of the 17 questions. Compared with ACASI, the percentage of reported sensitive behaviors was higher for video-mediated interviews for eight out of the 17 questions. Among the eight questions, a marginally significant difference on reporting between video-mediated interviews and ACASI was found for three questions: (1) ever felt that everything was an effort during the past 12 months when you were the most depressed, anxious, or emotionally stressed; (2) had more than two drinks on the days that you drank during the past 30 days; and (3) has a person of the same sex ever performed oral sex on you. Although the questionnaire was administered by interviewers, the findings seem to suggest that video-mediated interviews enhance reporting of sensitive information relative to ACASI. Respondents seemed to feel

more comfortable disclosing highly sensitive information in a mediated distant interviewing environment than in a self-administered mode.

**Table 6.16** Percentage of reported selected behaviors by mode (video-mediated interview vs. ACASI)

	Video-mediated Interview		ACASI		Statistic	
	% (Cell Size)	n	% (Cell Size)	n	$\chi^2$	p-value
A1	43.48 (10)	23	56.52 (13)	31	0.01	0.91
A2	51.35 (19)	23	48.65 (18)	31	3.69	0.06
A3	57.14 (16)	31	42.86 (12)	31	1.04	0.31
A4	57.69 (15)	25	42.31 (11)	32	3.72	0.05
A5	66.67 (4)	4	33.33 (2)	32	--	--
A7	33.33 (3)	30	66.67 (6)	31	1.06	0.30
A8	50.00 (22)	30	50.00 (22)	30	--	--
A9	52.17 (12)	28	47.83 (11)	29	0.14	0.70
A10	50.00 (30)	31	50.00 (30)	31	--	--
B1	50.00 (15)	32	50.00 (15)	31	0.01	0.90
B2	60.00 (6)	32	40.00 (4)	31	0.40	0.53
B3	37.50 (6)	32	62.50 (10)	31	1.52	0.22
B5	50.00 (17)	27	50.00 (17)	31	0.39	0.53
B7	62.50 (5)	32	37.50 (3)	31	0.50	0.48
B10	59.09 (13)	31	40.91 (9)	30	0.94	0.33
B11	27.27 (3)	32	72.73 (8)	31	2.95	0.09
	<b>Mean (SD)</b>	<b>n</b>	<b>Mean (SD)</b>	<b>n</b>	<b>t -test</b>	<b>p-value</b>
A11	176.8 (52.75)	31	162.7 (30.08)	31	1.29	0.20

Note: no sensitive admission for A6, B4, B6, B8, and B9

Table 6.17 presents the percentage of reported sensitive behaviors between CAPI and ACASI. Responses to all questions were recoded into dichotomous or binary variables due to non-normal distribution, zero or small cell sizes expect for the open-ended question on weight. Compared with ACASI, the percentage of reported sensitive behaviors was lower for CAPI on 11 out of the 17 questions, which is in line with the literature. Among the 11 questions, significant differences in reporting between CAPI and ACASI were found for the open-ended weight question. The findings suggest that respondents were more willing to report sensitive behaviors when the questions are self-administered than when they are administered by an interviewer.



**Table 6.17** Percentage of reported selected behaviors by mode (CAPI vs. ACASI)

	CAPI		ACASI		Statistic	
	% (Cell Size)	n	% (Cell Size)	n	$\chi^2$	p-value
A1	36.00 (9)	16	64.00 (16)	30	0.03	0.85
A2	37.14 (13)	16	62.86 (22)	30	0.36	0.55
A3	40.00 (10)	31	60.00 (15)	30	1.98	0.16
A4	46.15 (12)	27	53.85 (14)	31	0.003	0.96
A5	40.00 (4)	4	60.00 (6)	31	--	--
A7	50.00 (3)	29	50.00 (3)	31	0.007	0.93
A8	51.43 (18)	28	48.57 (17)	29	0.19	0.66
A9	52.17 (12)	28	47.83 (11)	29	0.14	0.70
A10	50.88 (29)	31	49.12 (28)	30	0.001	0.97
B1	54.29 (19)	31	45.17 (16)	31	0.59	0.44
B2	42.86 (3)	31	57.14 (4)	31	0.16	0.69
B3	43.48 (10)	31	56.52 (13)	31	0.62	0.43
B5	39.29 (11)	23	60.71 (17)	31	0.26	0.61
B7	40.00 (2)	31	60.00 (3)	31	0.22	0.64
B10	40.00 (10)	29	60.00 (15)	28	2.11	0.15
B11	50.00 (6)	31	50.00 (6)	31	--	--
	Mean (SD)	n	Mean (SD)	n	t -test	p-value
A11	171.9 (29.18)	31	194.8 (47.33)	30	-2.27	0.03

Note: no sensitive admission for A6, B4, B6, B8, and B9

#### 6.4 Data Mining Approaches

As Chapter 5 shows, question position has significant effects on disclosure of moderately sensitive information. In order to see whether the effects of vocal similarity and the vocal similarity by rapport interaction on disclosure also follow a certain pattern in the ACASI module, I grouped individual questions under particular survey topics and fitted random-effects multilevel multinomial logistic regression models that treat respondents as nested within interviewers as well as the responses as nested within respondents. These models estimated the probability of disclosure taking into account all the questions under each particular topic. The random effects associated with interviewer intercepts were omitted from all models because the variance components were estimated to be zero, whereas the random effects associated with respondent intercepts were retained. Detailed modeling information is given in Appendix F.

**Table 6.18** Probability of disclosure given question topics in the ACASI module

<b>Topic</b>	<b>Voice (%)</b>		<b>Rapport (%)</b>	
	<b>Different</b>	<b>Same</b>	<b>High</b>	<b>Low</b>
Alcohol Consumption	51.56	39.39	49.19	41.67
Use of Marijuana and Tranquilizer	29.33	30.95	34.53	26.07
Sexual Behaviors	43.95	44.77	46.65	42.09
Mental Health, Weight, and others	19.65	27.44	16.49	31.91

Note: probabilities are calculated based on estimated marginal means

As Table 6.18 shows, compared with the same voice condition, the probability of disclosure was higher for the different voice condition on the topic of alcohol consumption. The differences in disclosure between the different and the same voice conditions were small on topics of the use of marijuana and tranquilizers, and sexual behaviors; whereas the probability of disclosure was much lower for the different voice condition on the topic of mental health, weight, and others. Compared with prior low-rapport interviews, the probability of disclosure was higher for prior high-rapport interviews on topics of alcohol consumption, use of marijuana and tranquilizers, and sexual behaviors; whereas the probability of disclosure was lower for prior high-rapport interviews on the topic of mental health, weight, and others. It seems that the direction of the effects of vocal similarity and rapport on disclosure changed when asking questions on mental health, weight, and others. Questions on these topics were asked in the last 1/6 or 1/7 of the ACASI module depending on the questionnaire version. I therefore created a variable—question position (first 5/6 or 6/7 of the questionnaire and last 1/6 or 1/7 of the questionnaire).

In order to explore the additional information the data provided, I fitted a random-effects multilevel multinomial logistic regression model to predict disclosure in ACASI with three experimental variables (mode in the preceding module, vocal

similarity, and questionnaire version), variables based on observational data (rapport in the preceding module and question position) and the covariate (question sensitivity) as well as all possible two-way and three-way interactions. Except for the voice by rapport interaction, I must note that the inclusion of other interactions was exploratory and intended to generate hypotheses for future research, as no empirical work or theory exists that would support expectations for which of these interactions would be significant.

I constructed models of disclosure using the “top-down” model building strategy discussed by West, Welch, and Galecki (2007) and Verbeke and Molenberghs (2000) for multilevel modeling problems. I started with an initial full model, including fixed effects of mode in the preceding module, vocal similarity, questionnaire version, rapport in the preceding module, question position, question sensitivity, and all possible two-way and three-way interactions. The model also includes random effects associated with interviewers as well as random effects associated with respondents. The random effects associated with interviewer intercepts were omitted because the variance components were estimated to be zero. Variances of random intercepts for respondents were tested against zero using an appropriate likelihood ratio test, based on maximum likelihood estimation. The test results rejected the null hypothesis and I therefore retained the random effects associated with respondents in the model. Next, I tested whether fixed-effect parameters of all the interactions are needed in the model using appropriate likelihood ratio tests. Details on model selection are provided in Appendix G. The estimated residual variance of the random effects associated with the intercept for respondents was 0.17 in the final model. The residual intraclass correlation coefficient was 0.05.

Table 6.19 presents estimates of the parameters in the final model and the random effects associated with respondent intercepts. Both question position and question sensitivity have significant effects on disclosure after controlling for all other predictors. In addition, both the mode by question position interaction and the questionnaire version by question position interaction have significant effects on disclosure after controlling for all other predictors. Furthermore, there was a significant three-way interaction (questionnaire version by question position by question sensitivity). Question position and question topics are completely confounded in the current study. It is unknown if the effects of question position on disclosure were driven by the particular question topic or were due to the course of the interaction. As Table 6.1 shows, the division of questions into Set A and Set B took into consideration both question topics and question sensitivity. The mean sensitivity ratings for the two sets are similar. It is puzzling why questionnaire version has significant effects on disclosure. It seems to suggest that content of the questionnaire matters—how a particular question functions seems to affect the overall outcome.

**Table 6.19** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure in ACASI using random effects associated with respondent intercepts for exploratory purposes

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-0.73	0.18	-3.98***	118
Mode	Video-mediated Interview	-0.04	0.19	-0.19	118
Rapport	High Rapport	-0.14	0.25	-0.58	118
Vocal Similarity	Different Voice	0.08	0.17	0.49	118
Questionnaire Version	Version 2	0.15	0.22	0.67	118
Question Position	Last 1/6 or 1/7 of the ACASI Questionnaire	0.70	0.25	2.77**	118
Question Sensitivity	High Sensitivity	0.37	0.18	2.03*	120
<b>Interaction</b>					
Mode × Rapport	Video-mediated Interview × High Rapport	0.50	0.35	1.41	118
Mode × Question Position	Video-mediated Interview × Last 1/6 or 1/7	-0.46	0.23	-2.06*	118
Vocal Similarity × Questionnaire Version	Different Voice × Version 2	-0.10	0.25	-0.43	118
Vocal Similarity × Question Position	Different Voice × Last 1/6 or 1/7	-0.47	0.28	-1.71	118
Questionnaire Version × Question Position	Version 2 × Last 1/6 or 1/7	-1.75	0.42	-4.21***	118
Mode × Question Sensitivity	Video-mediated Interview × High Sensitivity	0.04	0.21	0.17	120
Rapport × Question Sensitivity	High Rapport × High Sensitivity	0.47	0.28	1.67	120
Questionnaire Version × Question Sensitivity	Version 2 × High Sensitivity	-0.07	0.20	-0.32	120
Question Position × Question Sensitivity	Last 1/6 or 1/7 × High Sensitivity	-0.09	0.28	-0.32	121
Vocal Similarity × Questionnaire Version × Question Position	Different voice × Version 2 × Last 1/6 or 1/7	0.93	0.47	1.97	118
Mode × Rapport × Question Sensitivity	Video-mediated Interview × High Rapport × High Sensitivity	-0.65	0.40	-1.61	120
Questionnaire Version × Question Position × Question Sensitivity	Version 2 × Last 1/6 or 1/7 × High Sensitivity	1.35	0.48	2.84**	121
<b>Covariance Parameter</b>		<b>Estimate</b>	<b>SE</b>		
$\sigma_{\text{int:respondent}}^2$		0.17	0.05		

Note: \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

$\sigma_{\text{int:respondent}}^2$  refers to random effects associated with respondent intercepts

### *6.5 Respondent Debriefing Items*

Respondents were given seven debriefing questions at the end of the ACASI module assessing their experience with the ACASI module. Respondents were asked how similar completing the ACASI module was to interacting with the interviewer in the preceding module (CAPI or video-mediated interviews); how similar the ACASI voice sounded to the interviewer's voice in the preceding module; how much they enjoyed taking part in the ACASI module; whether they found the topics in the ACASI module to be interesting; how much privacy they felt they had during the ACASI module; how concerned they were about the interviewer finding out how they answered the questions during the ACASI module; and how comfortable they were with the ACASI module.

As a manipulation check, the estimated odds of finding the ACASI voice to be extremely different from the interviewer's voice for respondents in the different voice condition relative to the same voice condition were 11.86 ( $p < 0.0001$ ). Respondents who experienced high rapport in the preceding module enjoyed the ACASI module more ( $p = 0.01$ ), found the topics to be more interesting ( $p = 0.01$ ), and felt that they had more privacy in the ACASI module ( $p = 0.005$ ).

### *6.6. Summary and Discussion*

With a laboratory experiment, I tested whether the interviewer–respondent interaction in the preceding module may have affected disclosure in the subsequent ACASI module. I manipulated the voice used in the ACASI audio file so that the ACASI voice either sounded very similar to the interviewer's voice in the preceding module or sounded very different from the interviewer's voice in the preceding module. I hypothesized that: (1) when the ACASI voice is very similar to the

interviewer's voice in the CAPI/video-mediated interview, respondents will disclose less highly sensitive information than their counterparts for whom the two voices are more distinct; (2) when the ACASI voice is more similar to the interviewer's voice in the CAPI/video-mediated interview, respondents who experienced high rapport in the preceding module will disclose less than their counterparts who experienced low rapport in the preceding module; and (3) when the ACASI voice is clearly different from the interviewer's voice in the CAPI/video-mediated interview, rapport in that interview will not affect disclosure.

There was no significant difference in disclosure between the same voice and the different voice condition. It seems that respondents understood that ACASI is a self-administered mode of data collection and that the voice used in the ACASI audio file is inanimate. Respondents had an incentive to disregard the humanizing cues: They were asked to disclose highly sensitive information. This may cause respondents to turn off the mechanism that produces the feeling of social presence, and instead, to primarily notice the absence of a human interviewer. So they were able to ignore the vocal cues even if the ACASI voice sounded very similar to the interviewer's voice in the preceding module and treated ACASI simply as a piece of technology.

I found marginally significant carryover effects of rapport in the preceding module on disclosure in the subsequent ACASI module. Respondents who experienced high rapport in the preceding module disclosed more in the subsequent ACASI module. It seems to suggest that rapport not only enhances reporting of moderately sensitive information when the questions are administered by an interviewer (CAPI or video-mediated interviews) but also improves reporting of highly sensitive information in the subsequent ACASI module. Even if the ACASI voice sounded very similar to the interviewer's voice—which works as a reminder of

the presence of the interviewer—respondents who experienced high rapport in the preceding module still disclosed more sensitive information in the ACASI module. Establishing rapport with the respondents seems to be the right strategy to take, which enhances disclosure in both interviewer-administered (CAPI or video-mediated interviews) and self-administered (ACASI) modes of data collection.

In addition, compared with ACASI, I found that the percentage of reported sensitive behaviors was higher for video-mediated interviews for eight out of the 17 highly sensitive questions. It seems that video-mediated interviews enhance reporting of highly sensitive information relative to ACASI. Respondents seemed to feel more comfortable to disclose highly sensitive information in a mediated distant interviewing environment.



## Chapter 7 Summary, Limitations, and Future Research

### *7.1 Summary*

Although there is no universally accepted way to define and operationalize rapport, the general consensus is that it can have an impact on survey responses (e.g., Foucault, 2010; Lavin & Maynard, 2001), potentially affecting data quality. With a personal interviewing style, rapport-related verbal behaviors were found to increase the disclosure of sensitive information (e.g., Dijkstra, 1987). With standardized interviewing, the respondent's sense of rapport was found to be greater when the interviewer smiled and nodded more often and when the interviewer gazed directly at the respondent less often (Foucault, 2010). To date, however, little is known about the effects of rapport on data quality in standardized interviewing. For example, it is unknown whether interviews with high rapport will illicit more or less honest responses from respondents, and whether the effects of rapport on disclosure will vary based upon the sensitivity of the survey questions.

Moderately sensitive information is often asked in the interviewer-administered mode of data collection. In video-mediated interviews, the interviewer and the respondent can see and talk to each other via a video window. Video-mediated interviews provide several potential advantages for surveys. For instance, respondents of video-mediated interviews may feel more engaged or connected than those in telephone interviews due to a greater sense of social presence. It is a cost-saving alternative to in-person interviews, especially when interviewing geographically dispersed respondents. Additionally, there may be certain types of questions that especially benefit from social distance through video-mediated interviews instead of face-to-face interviews. However, these hypotheses have, so far,

not been tested empirically. Although rapport-related verbal behaviors have been found to increase the disclosure of moderately sensitive information in face-to-face interactions (e.g., van der Zouwen, Dijkstra, & Smit 1991), it is unknown if rapport can be established to the same extent in video-mediated interviews, leading to similar levels of disclosure.

Highly sensitive information is usually collected via self-administered modes of data collection. For some time, audio computer-assisted self-interviewing (ACASI) has been seen as one of the best methods for collecting information about topics such as illicit drug use or sexual behaviors. Typically, the respondent first answers questions about nonsensitive topics in computer-assisted personal interviewing (CAPI) and is then switched to ACASI for sensitive questions. The general finding is that ACASI increases disclosures of sensitive information relative to CAPI (e.g., Tourangeau & Smith, 1996). In these studies, ACASI is treated as an independent mode of data collection, even though the ACASI module follows a CAPI module. None of the existing research has investigated the possibility that the interviewer-respondent interaction, prior to the ACASI questions, may affect disclosures in ACASI. Particularly, if the ACASI voice sounded very similar to the interviewer's voice in the preceding module.

This dissertation used a laboratory experiment that was made up of two related studies, aiming at answering these questions. The first study compares video-mediated interviews with face-to-face interviews in a laboratory experiment to investigate (1) whether rapport can be similarly established in video-mediated and computer-assisted personal interviews (CAPI); and (2) whether video-mediated interviews increase the disclosure of moderately sensitive information to the same

extent as CAPI. The second study examines whether the interviewer-respondent interaction, prior to the ACASI questions, may affect disclosure in ACASI.

To investigate these research questions, we created a 2×2×2×2 fully crossed factorial design that varies the level of rapport in the prior interaction (high vs. low), the mode of data collection in the prior interaction (CAPI vs. video-mediated interviews), the vocal similarity of the interviewer in the prior interaction to the voice on the ACASI audio file (same vs. different) and the version of the questionnaire (version 1 vs. version 2). We recruited 128 respondents from the population of full-time staff employees at the University of Michigan via email and on-campus flyers. In the experiment, the respondent first completed a 35 minute interviewer-administered CAPI or a video-mediated interview, and then completed a 15 minute self-administered ACASI module.

In order to organize the questionnaire by question sensitivity, so that non-sensitive and moderately sensitive questions are used in CAPI/video-mediated interviews, while highly sensitive questions are used in ACASI, we recruited raters from the Amazon Mechanical Turk to assess the sensitivity of survey questions. In addition, a screening procedure was used to select interviewers who naturally had higher or lower rapport. The interviewer selection was based upon respondents' evaluations of the interviewers' rapport level. Furthermore, two studies of interviewer voices were conducted with Amazon Mechanical Turk workers to create a different voice condition for each interviewer in the ACASI module.

The first study, presented in Chapter 5, investigated whether rapport can be established to the same extent in video-mediated interviews as in CAPI, leading to similar levels of disclosure of moderately sensitive information. We hypothesized

that: (1) rapport would be lower in video-mediated interviews than CAPI, and that (2) respondents in video-mediated interviews would be less disclosive of moderately sensitive information compared to CAPI.

Both interviewers and respondents were asked to assess the rapport they felt during the interview at the end of the CAPI or video-mediated interviews using the same two rapport scales. I found a small and insignificant correlation between the respondents' and the interviewers' rapport ratings. Interviewers who were rated high or low in rapport during the interviewer screening received low or high rapport ratings, respectively, for some of the interviews they conducted. The data supports the argument that rapport is an interactive dynamic phenomenon rather than a personality trait in one or both conversational partners. I therefore used the respondents' rapport ratings for their individual interviews in the analysis.

The two hypotheses of the first study were partially supported by the data. There was no significant difference in rapport ratings between video-mediated and CAPI interviews, suggesting no evidence that rapport is any better established in CAPI than video-mediated interviews. Compared with CAPI, higher disclosure of moderately sensitive information was found in video-mediated interviews, though the effects were only marginally significant. This finding is in the opposite direction to the hypothesis. It seems to suggest that people are more comfortable to disclose in a mediated interviewing environment. The social distance created by video-mediated interviews seems to be beneficial not only when asking for highly sensitive information but also when asking for moderately sensitive information. Video-mediated interactions may give people more control over the interaction. In addition, if respondents think the interviewer is in a remote location, they may become less

concerned about how they are judged by interviewer, and therefore, they may disclose more.

In addition, I compared the probability of disclosure in high rapport interviews with that in low rapport interviews for each topic used in CAPI or video-mediated interviews. The probability of disclosure was higher in high rapport interviews for most of the topics. However, the probability of disclosure was higher in low rapport interviews for topics related to mental health, religion and voting. I therefore created a variable—question position—and used in the overall random-effects multilevel multinomial logistic regression to predict disclosure. The overall model included one experimental variable (mode), variables based on observational data (rapport and question position) and the covariate (question sensitivity) as well as all possible two-way and three-way interactions. With appropriate likelihood ratio tests, the final model was created with random effects associated with respondent intercepts (see Chapter 5 Section 5.4.3).

The effects of rapport on disclosure were not statistically significant. However, the effects of the rapport by question position interactions on disclosure were significant. The probability of disclosure in high rapport interviews was higher during the first 1/3 and the last 1/2 of the questionnaire; whereas the probability of disclosure in the high rapport interviews was lower in the 1/3-1/2 of the questionnaire.

It is puzzling that low-rapport interviews produced significantly more disclosure than high rapport interviews during the 1/3 to 1/2 of the questionnaire. Respondents may become more comfortable in disclosing during low rapport interviews if questions are highly sensitive. It may also have something to do with what happened during the interview. The respondent and the interviewer in a high

rapport interview may develop a positive relationship very quickly and maintain that relationship over the course of the interaction. The effects of rapport on disclosure may be quite stable under this circumstance. It seems that high rapport not only elicited more disclosure of sensitive information at the beginning of an interview but also kept respondents motivated and successfully maintained the level of disclosure at a later stage of the interview (see Figure 5.1). The flow of interaction between the respondent and the interviewer in a low rapport interview, however, may be strained and limited during the course of the interaction. With low rapport interviews, there was a sharp reduction in disclosure of sensitive information for the latter half of the interview (see Figure 5.1). This may be because respondents become fatigued and lose interest in the interview and therefore wanted to complete the interview as quickly as possible. In addition, there was not enough rapport to enhance respondents' efforts or motivate them to be more honest. However, the effects of topics and question position were confounded in the current study because the presentation of topics in the questionnaire was not randomized.

A further investigation of the effects of the rapport by question position by question sensitivity interactions on disclosure seemed to suggest that (1) rapport improves disclosure of questions low in sensitivity at the beginning of an interview, and (2) rapport improves and maintains the level of disclosure for questions high in sensitivity during a later stage of the interview. Furthermore, responses to the respondent debriefing items seemed to suggest that respondents enjoyed the interview more in the high rapport video-mediated interviews.

The second study, presented in Chapter 6, examined the carryover effects of the preceding module (CAPI or video-mediated interviews) on reporting of highly sensitive information in the subsequent ACASI module. I hypothesized that: (1) when

the ACASI voice is very similar to the interviewer's voice in the CAPI/video-mediated interview, respondents will disclose less highly sensitive information than their counterparts for whom the two voices are more distinct; (2) when the ACASI voice is more similar to the interviewer's voice in the CAPI/video-mediated interview, respondents who experienced high rapport in the preceding module will disclose less than their counterparts who experienced low rapport in the preceding module; and (3) when the ACASI voice is clearly different from the interviewer's voice in the CAPI/video-mediated interview, rapport in that interview will not affect disclosure.

There was no significant difference on disclosure between the same voice and the different voice condition. It seems that respondents understood that ACASI is a self-administered mode of data collection and that the voice used in the ACASI audio file is inanimate. Respondents had an incentive to disregard the humanizing cues: They were asked to disclose sensitive information. This may cause respondents to turn off the mechanism that produces the feeling of social presence, and instead, to primarily notice the absence of a human interviewer. So they were able to ignore the vocal cues even if the ACASI voice sounded very similar to the interviewer's voice in the preceding module and treated ACASI simply as a piece of technology. In addition, the effects of the vocal similarity by rapport interactions on disclosure were not statistically significant in the ACASI module.

However, I found marginally significant carryover effects of rapport in the preceding module on disclosure in the subsequent ACASI module. Respondents who experienced high rapport in the preceding module gave more disclosure of highly sensitive information in the subsequent ACASI module. It seems to suggest that rapport not only enhances reporting of moderately sensitive information when the questions are administered by an interviewer (CAPI or video-mediated interviews)

but also improves reporting of highly sensitive information in the subsequent ACASI module, though the ACASI module was self-administered and the interviewer was not physically present. Even if the ACASI voice sounded very similar to the interviewer's voice—which works as a reminder of the presence of the interviewer—respondents who experienced high rapport in the preceding module still provided more disclosure of sensitive information in the ACASI module. Establishing rapport with the respondents seems to be the right strategy to take, which enhances disclosure in both interviewer-administered (CAPI or video-mediated interviews) and self-administered (ACASI) modes of data collection.

Additionally, compared with ACASI, I found that the percentage of reported sensitive behaviors was higher for video-mediated interviews for eight out of the 17 highly sensitive questions. It seems to suggest that video-mediated interviews enhance reporting of highly sensitive information relative to ACASI. Respondents seemed to feel more comfortable to disclose highly sensitive information in a mediated distant interviewing environment. Compared with ACASI, the percentage of reported sensitive behaviors was lower for CAPI on most of the questions, which is in line with the literature.

Furthermore, responses to the respondent debriefing items seemed to suggest that respondents who experienced high rapport in the preceding module enjoyed the ACASI module more, found the topics to be more interesting, and felt that they had more privacy in the ACASI module.

## *7.2 Limitations*

This laboratory experiment has some limitations. First, we were not able to obtain a representative sample due to the relatively small number of participants as



well as recruiting challenges and therefore generalization of the findings to any greater population requires caution.

Another limitation was the use of Amazon Mechanical Turk workers rather than the actual respondents to assess the sensitivity of survey questions. People vary in how much they worry about any negative consequences of giving a truthful answer, partially depending on whether they have anything to hide. For example, a question on nonmedical use of pain relievers is subject to social desirability effects only among those respondents who did use pain relievers for nonmedical purposes. It is possible that questions rated as moderately sensitive by raters were considered highly sensitive by the actual respondents, and vice versa.

Additionally, the effects of topics and question position on disclosure in both CAPI or video-mediated interviews and the ACASI module were confounded because the presentation of topics in the questionnaire was not randomized. Under this circumstance, it becomes impossible to determine whether topics or question position affect disclosure of sensitive information. Furthermore, respondents' true values for the socially desirable and undesirable behaviors were unknown, which makes a direct assessment of the reporting error impossible. Finally, rapport was rated by respondents at the end of the CAPI or video-mediated interviews. Ideally, real time assessments of rapport are required in order to examine its effects on disclosure to individual questions.

### *7.3 Future Research*

To address these limitations, we suggest some areas for future research. First, it is important to replicate the experiment by randomizing the presentation of topics in the questionnaire as well as asking respondents rather than raters to assess the

sensitivity of survey questions at the end of the CAPI or video-mediated interviews. Randomizing the presentation of topics in the questionnaire will allow us to disentangle the effects of topics from that of question position. So we will be able to determine whether particular topic or certain stage of the interaction affects disclosure. Asking respondents to evaluate question sensitivity at the end of the interview will provide direct measurements of question sensitivity that takes into account the respondents' actual status on the sensitive behaviors.

In addition, it is important to confirm the results of the study using a representative sample with larger sample size as well as external validation data. A larger sample size generally leads to more accurate estimates of the parameters. With external validation data, we will be able to perform direct assessments of the effects of the experimental variables on disclosure by focusing on respondents who are at risk of misreporting. Furthermore, it will be helpful to have real time measures of rapport across the questionnaire to capture its interactive dynamic nature and provide more precise estimates of its effects on disclosure to individual questions.

Finally, behavioral coding and conversation analysis of the audio or video recording of the interviews will provide additional information to improve our understanding of the establishment of rapport and its impact on disclosure of sensitive information. For example, interviewers who gazed directly at the respondents when asking for highly sensitive information may make the respondents feel like they are being interrogated and therefore lead to less disclosure, whereas interviewers who change their speech behaviors to match that of the respondent may create a sense of similarity and therefore collect more sensitive information from the respondent.

## Appendices

### Appendix A: Wording of the Questions and Their Mean Sensitivity Ratings

Question Number	Question Wording	Mean Sensitivity Rating	Std Dev
2	<p>Would you say that in general your health is...</p> <ol style="list-style-type: none"> <li>1. Excellent</li> <li>2. Very good</li> <li>3. Good</li> <li>4. Fair</li> <li>5. Poor</li> </ol>	2.82	1.08
3	<p>In general, how healthy is your overall diet? Would you say...</p> <ol style="list-style-type: none"> <li>1. Excellent</li> <li>2. Very good</li> <li>3. Good</li> <li>4. Fair</li> <li>5. Poor</li> </ol>	3.33	1.30
4	<p>In the past 30 days, how often did you have milk to drink or on your cereal? Please include chocolate and other flavored milks as well as hot cocoa made with milk. Do not count small amounts of milk added to coffee or tea. Would you say..</p> <ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely--less than once a week</li> <li>3. Sometimes--once a week or more, but less than once a day</li> <li>4. Often--once a day or more</li> </ol>	1.38	0.65
5	<p>A regular milk drinker is someone who uses any type of milk at least 5 times a week. Using this definition, which statement best describes you?</p> <ol style="list-style-type: none"> <li>1. I've been a regular milk drinker for most or all of my life, including my childhood</li> <li>2. I've never been a regular milk drinker</li> <li>3. My milk drinking has varied over my life--sometimes I've been a regular milk drinker and sometimes I have not been a regular milk drinker</li> </ol>	1.50	0.90

6	Next I'm going to ask you about meals. By meal, I mean breakfast, lunch and dinner. During the past 7 days, how many meals did you get that were prepared away from home in places such as restaurants, fast food places, food stands, grocery stores, or from vending machines? Please do not include meals provided as part of the community programs, for example, "Meals on Wheels", or any other programs.	2.64	1.36
7	Some grocery stores sell "ready to eat" foods such as salads, soups, chicken, sandwiches and cooked vegetables in their salad bars and deli counters. During the past 30 days, how often did you eat "ready to eat" foods from the grocery store? Please do not include sliced meat or cheese you buy for sandwiches and frozen or canned foods.	2.25	0.75
8	During the past 30 days, how often did you eat frozen meals or frozen pizzas?	2.27	1.10
9	In the past 12 months, did you buy food from fast food or pizza places?  1. Yes 2. No	1.75	1.22
10	The last time when you ate out or bought food at a fast-food or pizza place, did you see nutrition or health information about any foods on the menu?  1. Yes 2. No	2.42	1.08
11	The last time when you ate out or bought food at a fast-food or pizza place, did you see nutrition or health information about any foods on the menu? IF YES...Did you use the information in deciding which foods to buy?  1. Yes 2. No	2.58	1.16
12	If nutrition or health information were readily available in fast food or pizza places, would you use it often, sometimes, rarely, or never, in deciding what to order?  1. Often 2. Sometimes 3. Rarely 4. Never	2.60	1.35

13	In the past 12 months, did you eat at a restaurant with waiter or waitress service?  1. Yes 2. No	1.25	0.45
14	Think about the last time you ate at a restaurant with a waiter or waitress. Is it a chain-restaurant?  1. Yes 2. No	1.50	0.67
15	Think about the last time you ate at a restaurant with a waiter or waitress. Did you see nutrition or health information about any foods on the menu?  1. Yes 2. No	1.58	0.79
16	Did you use the information in deciding which foods to buy?  1. Yes 2. No	2.00	0.95
17	If nutrition or health information were readily available in restaurants with a waiter or waitress, would you use it often, sometimes, rarely, or never, in deciding what to order?  1. Often 2. Sometimes 3. Rarely 4. Never	2.17	1.40
18	The next question is about your use of dietary supplements, nonprescription antacids, and prescription medications during the past 30 days. Have you used or taken any vitamins, minerals, herbals or other dietary supplements in the past 30 days? Include prescription and non-prescription supplements.  1. Yes 2. No	1.92	0.90
19	About how often do you drink regular soda or pop that contains sugar? Do not include diet soda or diet pop.	2.33	1.23
20	About how often do you drink sweetened fruit drinks, such as Kool-aid, cranberry, and lemonade? Include fruit drinks you	2.00	1.28

	made at home and added sugar to.		
21	Have you ever been told by a doctor or other health professional that you have diabetes or sugar diabetes?  1. Yes 2. No	1.83	0.83
22	Have you ever been told by a doctor or other health professional that you had hypertension, also called high blood pressure?  1. Yes 2. No	1.92	1.16
23	Are you currently taking medicine for your high blood pressure?  1. Yes 2. No	1.42	0.51
24	Blood cholesterol is a fatty substance found in the blood. Have you ever had your blood cholesterol checked?  1. Yes 2. No	1.92	0.90
25	Have you ever been told by a doctor, nurse or other professional that your blood cholesterol is high?  1. Yes 2. No	2.25	0.97
26	The next question is about your teeth and gums. About how long has it been since you last visited a dentist? Include all types of dentists, such as, orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists.  1. 6 months or less 2. More than 6 months, but not more than 1 year ago 3. More than 1 year, but not more than 2 years ago 4. More than 2 years, but not more than 3 years ago 5. More than 3 years, but not more than 5 years ago 6. More than 5 years ago	2.75	0.97
27	The next questions are about exercise, recreation, or physical activities other than	2.36	1.29

	<p>your regular job duties. In a typical week, other than your regular job, do you do any vigorous-intensity sports, fitness, or recreational activities that cause large increases in breathing or heart rate like running or basketball for at least 10 minutes continuously?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>		
28	<p>In a typical week, other than your regular job, do you do any moderate-intensity sports, fitness, or recreational activities that cause small increases in breathing or heart rate such as brisk walking, bicycling, swimming, or golf for at least 10 minutes continuously?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	2.75	1.22
29	<p>Next, I would like to ask you a few questions about your sleep patterns. During the past 30 days, for about how many days have you felt you did not get enough rest or sleep?</p>	2.42	1.38
30	<p>On average, how many hours of sleep do you get in a 24-hour period? Think about the time you actually spend sleeping or napping, not just the amount of sleep you think you should get.</p>	1.67	0.78
31	<p>Have you ever told a doctor or other health professional that you have trouble sleeping?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	1.62	0.51
32	<p>Have you ever been told by a doctor or other health professional that you have a sleep disorder?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	1.67	0.78
33	<p>Would you like to weigh...</p> <ol style="list-style-type: none"> <li>1. More</li> <li>2. Less</li> <li>3. Stay about the same</li> </ol>	2.45	1.13
34	<p>During the past 30 days, how often did you feel nervous? Would you say...</p> <ol style="list-style-type: none"> <li>1. All of the time</li> </ol>	3.25	0.97

	2. Most of the time 3. Some of the time 4. A little of the time 5. None of the time		
35	During the past 30 days, how often did you feel restless or fidgety? Would you say...	2.64	1.21
	1. All of the time 2. Most of the time 3. Some of the time 4. A little of the time 5. None of the time		
36	During the past 30 days, how often did you feel so sad or depressed that nothing could cheer you up? Would you say...	2.82	1.08
	1. All of the time 2. Most of the time 3. Some of the time 4. A little of the time 5. None of the time		
37	During the past 30 days, how often did you feel that everything was an effort? Would you say...	2.10	1.10
	1. All of the time 2. Most of the time 3. Some of the time 4. A little of the time 5. None of the time		
38	During the past 30 days, how often did you feel down on yourself, no good or worthless? Would you say...	3.09	1.14
	1. All of the time 2. Most of the time 3. Some of the time 4. A little of the time 5. None of the time		
39	Now think about the past 12 months. Was there a month in the past 12 months when you felt more depressed, anxious, or emotionally stressed than you felt during the past 30 days?	3.00	1.21
	1. Yes 2. No		
40	Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed. During that month, how often did you feel nervous? Would you	2.50	0.80



	say...		
	<ol style="list-style-type: none"> <li>1. All of the time</li> <li>2. Most of the time</li> <li>3. Some of the time</li> <li>4. A little of the time</li> <li>5. None of the time</li> </ol>		
41	<p>Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed. During that month, how often did you feel restless or fidgety? Would you say...</p> <ol style="list-style-type: none"> <li>1. All of the time</li> <li>2. Most of the time</li> <li>3. Some of the time</li> <li>4. A little of the time</li> <li>5. None of the time</li> </ol>	2.42	0.90
42	<p>Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed. During that month, how often did you feel so sad or depressed that nothing could cheer you up? Would you say...</p> <ol style="list-style-type: none"> <li>1. All of the time</li> <li>2. Most of the time</li> <li>3. Some of the time</li> <li>4. A little of the time</li> <li>5. None of the time</li> </ol>	3.36	1.21
43	<p>Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed. During that month, how often did you feel down on yourself, no good, or worthless? Would you say...</p> <ol style="list-style-type: none"> <li>1. All of the time</li> <li>2. Most of the time</li> <li>3. Some of the time</li> <li>4. A little of the time</li> <li>5. None of the time</li> </ol>	3.08	1.04
44	<p>What religion are you now, if any?</p> <ol style="list-style-type: none"> <li>1. None</li> <li>2. Catholic</li> <li>3. Jewish</li> <li>4. Southern Baptist</li> <li>5. Baptist</li> <li>6. Methodist or African Methodist Lutheran</li> <li>7. Presbyterian</li> <li>8. Episcopal or Anglican</li> </ol>	1.45	0.69

	9. Church of Jesus Christ of Latter Day Saints (LDS/Mormon)		
	10. Other		
45	Currently, how important is religion in your daily life? Would you say it is very important, somewhat important, or not important?	3.33	1.15
	1. Very important		
	2. Somewhat important		
	3. Not important		
46	About how often do you attend religious services?	2.75	1.42
	1. More than once a week		
	2. Once a week		
	3. 2 - 3 times per month		
	4. Once a month (about 12 times a year)		
	5. 3 - 11 times a year		
	6. Once or twice a year		
	7. Never		
47	The next questions ask about voting. How often would you say you vote?	2.25	0.87
	1. Never		
	2. Rarely		
	3. Sometimes		
	4. Often		
48	In talking to people about elections, we often find that a lot of people were not able to vote because they weren't registered, they were sick, or they just didn't have time. Now think back to the election in 2012, which was a Presidential election. Which of the following statements best describes you: One, I did not vote in the 2012 Presidential election; Two, I thought about voting this time, but didn't; Three, I usually vote, but didn't this time; or Four, I am sure I voted?	2.25	1.22
	1. I did not vote in the 2012 Presidential election		
	2. I thought about voting this time, but didn't		
	3. I usually vote, but didn't this time		
	4. I am sure I voted		
49	How about the election for the House of Representatives in Washington. Did you vote for a candidate for the U.S. House of Representatives?	2.75	1.42

	<ol style="list-style-type: none"> <li>1. Yes, voted for House of Representatives</li> <li>2. No, didn't vote for House of Representatives</li> </ol>		
50_1	<p>Now think of the past 12 months, have you recycled used materials such as glass, cans, paper, and clothes?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	1.82	0.75
50_2	<p>Now think of the past 12 months, have you brought fair trade goods or anything in charity shop?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	2.25	1.29
50_3	<p>Now think of the past 12 months, have you given money or goods to other charitable causes?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	3.45	1.29
50_4	<p>Now think of the past 12 months, have you attended church, synagogue, or mosque almost every week?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	2.73	1.27
51	<p>How often do you use seat belts when you drive or ride a car? Would you say...</p> <ol style="list-style-type: none"> <li>1. Always</li> <li>2. Nearly always</li> <li>3. Sometimes</li> <li>4. Seldom</li> <li>5. Never</li> </ol>	2.33	0.98
52	<p>Have you ever used the Internet or World Wide Web?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	1.46	1.13
53_1	<p>In the past 30 days, how often have you visited a web site for news and current events?</p> <ol style="list-style-type: none"> <li>1. Never</li> <li>2. 1-2 times</li> <li>3. 3-5 times</li> <li>4. More than 5 times</li> </ol>	1.33	0.65

53_2	In the past 30 days, how often have you visited a web site for television or movies?  1. Never 2. 1-2 times 3. 3-5 times 4. More than 5 times	1.77	1.24
53_3	In the past 30 days, how often have you visited a web site for health and fitness?  1. Never 2. 1-2 times 3. 3-5 times 4. More than 5 times	1.80	1.03
53_4	In the past 30 days, how often have you visited a web site for travel?  1. Never 2. 1-2 times 3. 3-5 times 4. More than 5 times	1.36	0.67
53_5	In the past 30 days, how often have you visited a web site for sports?  1. Never 2. 1-2 times 3. 3-5 times 4. More than 5 times	1.18	0.40
53_6	In the past 30 days, how often have you visited a web site for religion or church related?  1. Never 2. 1-2 times 3. 3-5 times 4. More than 5 times	2.42	1.16
54	We are interested in how people are getting along financially these days. Would you say that you are better off or worse off financially than you were a year ago?  1. Better now 2. Same 3. Worse	2.46	1.20
55	Now looking ahead--do you think that a year from now you will be better off financially, or worse off, or just about the same as now?  1. Will be better off 2. Same	2.73	1.42

3. Will be worse off			
56	<p>Now turning to business conditions in the country as a whole--do you think that during the next 12 months we'll have good times financially, or bad times, or what?</p> <ol style="list-style-type: none"> <li>1. Good times</li> <li>2. Good with qualifications</li> <li>3. Pro-Con</li> <li>4. Bad with qualifications</li> <li>5. Bad times</li> </ol>	2.50	1.31
57	<p>As to the economic policy of the government--I mean steps taken to fight inflation or unemployment--would you say the government is doing a good job, only fair, or a poor job?</p> <ol style="list-style-type: none"> <li>1. Good job</li> <li>2. Only fair</li> <li>3. Poor job</li> </ol>	2.64	1.12
58	<p>During the next 12 months, do you expect your income to be higher or lower than during the past year?</p> <ol style="list-style-type: none"> <li>1. Higher</li> <li>2. About the same</li> <li>3. Lower</li> </ol>	2.83	1.40
59	<p>The next few questions ask about your views of the chances that various events will happen. Your answers can range from zero to one hundred, where zero means there is absolutely no chance, and one hundred means that it is absolutely certain. For example, when weather forecasters report the chance of rain, a number like 20 percent means "a small chance", a number around 50 percent means "a pretty even chance," and a number like 80 percent means "a very good chance." What do you think the chances are that your income will increase by more than the rate of inflation during the next five years or so?</p>	2.82	1.47
60	<p>Not counting minor traffic violations, have you ever been arrested and booked for breaking the law? Being 'booked' means that you were taken into custody and processed by the police or by someone connected with the courts, even if you were then released.</p> <ol style="list-style-type: none"> <li>1. Yes</li> </ol>	3.00	1.10

2. No			
61	Not counting minor traffic violations, how many times during the past 12 months have you been arrested and booked for breaking a law? Being 'booked' means that you were taken into custody and processed by the police or by someone connected with the courts, even if you were then released.	3.36	1.12
62_1	Being 'booked' means that you were taken into custody and processed by the police or by someone connected with the courts, even if you were then released. In the past 12 months, were you arrested and booked for driving under the influence of alcohol of drugs?  1. Yes 2. No	3.00	1.25
62_2	Being 'booked' means that you were taken into custody and processed by the police or by someone connected with the courts, even if you were then released. In the past 12 months, were you arrested and booked for fraud, possessing stolen goods, or vandalism?  1. Yes 2. No	3.42	1.38
63	Have you ever, even once, had a drink of any type of alcoholic beverage? Please do not include times when you only had a sip or two from a drink.  1. Yes 2. No	2.17	1.19
64	Think about the first time you had a drink of an alcoholic beverage. How old were you the first time you had a drink of an alcoholic beverage? Please do not include any time when you only had a sip or two from a drink.	3.08	1.00
65	How long has it been since you last drank an alcoholic beverage?  1. Within the past 30 days 2. More than 30 days ago but within the past 12 months 3. More than 12 months ago	2.36	1.03

66	<p>MALE: During the past 30 days, on how many days did you have 5 or more drinks on the same occasion? By “occasion”, we mean at the same time or within a couple of hours of each other.</p> <p>FEMALE: During the past 30 days, on how many days did you have 4 or more drinks on the same occasion? By “occasion”, we mean at the same time or within a couple of hours of each other.</p>	3.33	1.07
67	During the past 30 days, what is the largest number of drinks you had on any occasion?	3.42	1.00
68	<p>MALE: Was there ever a time or times in your life when you drank 5 or more drinks or any kind of alcoholic beverage almost every day?</p> <p>1. Yes 2. No</p> <p>FEMALE: Was there ever a time or times in your life when you drank 4 or more drinks or any kind of alcoholic beverage almost every day?</p> <p>1. Yes 2. No</p>	3.40	1.07
69	<p>Have you ever smoked part or all of a cigarette?</p> <p>1. Yes 2. No</p>	1.77	0.93
70	<p>Now think about the past 30 days. During the past 30 days, have you smoked part or all of a cigarette?</p> <p>1. Yes 2. No</p>	1.83	1.11
71	<p>Snuff is a finely ground form of tobacco that usually comes in a container called a tin. You can use snuff by placing a pinch or dip in your mouth between your lip and gum or between your cheek and gum. Snuff can also be inhaled through the nose. Snuff is sold in both loose form and in ready-to-use packets. Have you ever used snuff, even once?</p> <p>1. Yes 2. No</p>	2.15	1.21

72	Now think about the past 30 days. During the past 30 days, have you used snuff, even once?  1. Yes 2. No	1.85	1.07
73	The next questions are only about chewing tobacco. Chewing tobacco is coarsely shredded tobacco that is sold in pouches of loose tobacco leaves or in a “plug” or “twist” form. To use chewing tobacco, you either chew it or hold it in your cheek or inside your lower lip. Have you ever used chewing tobacco, even once?  1. Yes 2. No	2.25	1.06
74	Now think about the past 30 days. During the past 30 days, have you used chewing tobacco, even once?  1. Yes 2. No	2.67	1.30
75	The next questions are about smoking cigars. By cigars we mean any kind, including big cigars, cigarillos, and even little cigars that look like cigarettes. Have you ever smoked part or all type of cigar?  1. Yes 2. No	1.92	0.90
76	Now think about the past 30 days. During the past 30 days, have you smoked part or all of any type of cigar?  1. Yes 2. No	1.67	0.65
77	The next question is about marijuana and hashish. Marijuana is also called pot or grass. Marijuana is usually smoked, either in cigarettes, called joints, or in a pipe. It is sometimes cooked in food. Hashish is a form of marijuana that is also called “hash.” It is usually smoked in a pipe. Another form of hashish is hash oil. Have you ever, even once, used marijuana or hashish?  1. Yes 2. No	3.15	1.57



79	<p>Sometimes people take tobacco out of a cigar and replace it with marijuana. This is sometimes called a 'blunt'. Have you ever smoked part or all of a cigar with marijuana in it?</p> <p>1. Yes 2. No</p>	3.38	0.96
80	<p>The next question is about the use of pain relievers. We are not interested in your use of "over-the-counter" drugs that can be bought in drug stores or grocery stores without a doctor's prescription. We are interested in your use of any form of prescription pain relievers that were not prescribed for you or that you took only for the experience or feeling they caused. Have you ever, even once, used any pain relievers that was not prescribed for you or that you took only for the experience or feeling it caused? Such as Darvocet, Darvon, Tylenol with codeine, Percocet, Percodan, Tylox, Vicodin, Lortab, or Lorcet.</p> <p>1. Yes 2. No</p>	3.45	1.04
81	<p>MALE: Have you ever had sexual intercourse with a female (sometimes this is called making love, having sex, or going all the way)?</p> <p>1. Yes 2. No</p> <p>FEMALE: At any time in your life, have you ever had sexual intercourse with a man, that is , made love, had sex, or gone all the way?</p> <p>1. Yes 2. No</p>	2.91	1.38
82	<p>MALE: Have you ever put your penis in a female's vagina (also known as vaginal intercourse)?</p> <p>1. Yes 2. No</p> <p>FEMALE: Has a male ever put his penis in your vagina (also known as vaginal intercourse)?</p> <p>1. Yes</p>	2.82	1.25

	2. No		
83	<p>MALE: Was a condom used the last time you had vaginal intercourse with a female?</p> <p>1. Yes 2. No</p> <p>FEMALE: Was a condom used the last time you had vaginal intercourse with a male?</p> <p>1. Yes 2. No</p>	3.25	1.42
84	<p>MALE: The last time you had vaginal intercourse with a female, did you use the condom to...</p> <p>1. To prevent pregnancy 2. To prevent diseases like syphilis, gonorrhea or AIDS 3. For both reasons 4. Or for some other reason</p> <p>FEMALE: The last time you had vaginal intercourse with a male, did you use the condom to...</p> <p>1. To prevent pregnancy 2. To prevent diseases like syphilis, gonorrhea or AIDS 3. For both reasons 4. Or for some other reason</p>	3.27	1.27
85	<p>Would you say then that this first vaginal intercourse was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?</p> <p>1. Voluntary 2. Not voluntary</p>	3.40	0.97
86	<p>MALE: Think back to the very first time you had vaginal intercourse with a female. If this first vaginal intercourse was not voluntary, that is, you did not choose to have sex of your own free will. Were you given alcohol or drugs?</p> <p>1. Yes 2. No</p> <p>FEMALE: Think back to the very first time you had vaginal intercourse with a male. If this first vaginal intercourse was not voluntary, that is, you did not choose to</p>	3.46	0.97

	have sex of your own free will. Were you given alcohol or drugs?		
	1. Yes 2. No		
87	MALE: Have you ever had any sexual experience of any kind with another male?	3.36	1.12
	1. Yes 2. No		
	FEMALE: Have you ever had any sexual experience of any kind with another female?		
	1. Yes 2. No		
88	Next, I need to know your total earnings before taxes. Will it be easier for you to tell me your total weekly, monthly, or yearly earnings?	2.45	1.21
	1. Weekly 2. Monthly 3. Yearly		
89	Which category represents your total weekly earnings before taxes?	3.42	0.90
	1. UNDER \$96 2. \$ 96-143 3. \$ 144-191 4. \$ 192-239 5. \$ 240-288 6. \$ 289-384 7. \$ 385-480 8. \$ 481-576 9. \$ 577-672 10. \$ 673-768 11. \$ 769-961 12. \$ 962-1,153 13. \$1,154-1,441 14. \$1,442 or more		
90	Which category represents your total monthly earnings before taxes?	3.09	0.83
	1. UNDER \$417 2. \$ 417-624 3. \$ 625-832 4. \$ 833-1041 5. \$1,042-1,249 6. \$1,250-1,666 7. \$1,667-2,082 8. \$2,083-2,499 9. \$2,500-2,916		

	10. \$2,917-3,332 11. \$3,333-4,166 12. \$4,167-4,999 13. \$5,000-6,249 14. \$6,250 or more		
91	Which category represents your total yearly earnings before taxes?	3.08	1.12
	1. UNDER \$5,000 2. \$ 5,000-7,499 3. \$ 7,500-9,999 4. \$10,000-12,499 5. \$12,500-14,999 6. \$15,000-19,999 7. \$20,000-24,999 8. \$25,000-29,999 9. \$30,000-34,999 10. \$35,000-39,999 11. \$40,000-49,999 12. \$50,000-59,999 13. \$60,000-74,999 14. \$75,000 or more		
92	Next, I need to know your total earnings before taxes. Was it \$20,000 or more per year?	2.50	1.51
	1. Yes 2. No		
93	Next, I need to know your total earnings before taxes. Was it \$50,000 or more per year?	2.33	0.98
	1. Yes 2. No		
94	Next, I need to know your total earnings before taxes. Was it \$75,000 or more per year?	2.75	1.29
	1. Yes 2. No		
95	What is your age?	2.17	0.72
96	What is the highest grade or level of school you have completed or the highest degree you have received?	2.17	1.47
	1. Never attended/Kindergarten only 2. 1st Grade 3. 2nd Grade 4. 3rd Grade 5. 4th Grade 6. 5th Grade		

	7. 6th Grade 8. 7th Grade 9. 8th Grade 10. 9th Grade 11. 10th Grade 12. 11th Grade 13. 12th Grade, no diploma 14. High school graduate 15. GED or equivalent 16. Some college, no degree 17. Associated degree: Occupational, technical, or vocational program 18. Associated degree: Academic program 19. Bachelor's degree (example: BA, AB, BS, BBA) 20. Master's degree (example: MA, MS, MEng, MEd, MBA) Professional school degree (example: MD, DDS, DVM, JD) Doctoral degree (example: PhD, EdD)		
97	Are you Hispanic or Latina, or of Spanish origin?  1. Yes 2. No	1.83	1.03
98	Which one of the following groups would you say best describes your racial background?  1. White 2. Black or African American 3. Asian 4. Native Hawaiian or Other Pacific Islander 5. American Indian or Alaska Native	1.64	1.03
99	What is your current marital status? Are you...  1. Married 2. Not married but living together with a partner of the opposite sex 3. Widowed 4. Divorced 5. Separated, because you and your spouse are not getting along 6. Never been married	1.33	0.49
100	About how tall are you without shoes?	2.00	1.35
a1	Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed. During that	3.58	0.79

	<p>month, how often did you feel hopeless? Would you say...</p> <ol style="list-style-type: none"> <li>1. All of the time</li> <li>2. Most of the time</li> <li>3. Some of the time</li> <li>4. A little of the time</li> <li>5. None of the time</li> </ol>		
a2	<p>Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed. During that month, how often did you feel that everything was an effort? Would you say...</p> <ol style="list-style-type: none"> <li>1. All of the time</li> <li>2. Most of the time</li> <li>3. Some of the time</li> <li>4. A little of the time</li> <li>5. None of the time</li> </ol>	3.75	0.87
a3	<p>Now think of the past 12 months, have you given money or goods to the homeless?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	3.58	1.38
a4	<p>On the days that you drank during the past 30 days, how many drinks did you usually have each day? Count as a drink a can or bottle of beer; a wine cooler or a glass of wine, champagne, a sherry; a shot of liquor or a mixed drink or cocktail.</p>	3.77	0.93
a5	<p>How long has it been since you last smoked part or all of a cigar with marijuana in it?</p> <ol style="list-style-type: none"> <li>1. Within the past 30 days</li> <li>2. More than 30 days ago but within the past 12 months</li> <li>3. More than 12 months ago</li> </ol>	3.85	0.99
a6	<p>On how many days in the past 12 months did you use any prescription pain reliever that was not prescribed for you or that you took only for the experience or feeling it caused?</p>	3.67	1.15
a7	<p>How long has it been since you last used any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?</p> <ol style="list-style-type: none"> <li>1. Within the past 30 days</li> <li>2. More than 30 days ago but within the past 12 months</li> </ol>	4.09	0.30

3. More than 12 months ago			
a8	<p>MALE: The very last time you had any type of sex -- that is, vaginal intercourse or anal sex or oral sex -- with a female partner, did you use a condom?</p> <p>1. Yes 2. No</p> <p>FEMALE: The very last time you had any type of sex -- that is, vaginal intercourse or anal sex or oral sex -- with a male partner, was a condom used?</p> <p>1. Yes 2. No</p>	3.58	1.08
a9	<p>MALE: How many different females have you ever had intercourse with? This includes any female you had intercourse with, even if it was only once or if you did not know her well.</p> <p>1. One 2. Two 3. Three 4. Four 5. Five 6. Six 7. 7 or more</p> <p>FEAMLE: Counting all your male sexual partners, even those you had intercourse with only once, how many men have you had sexual intercourse with in your life?</p>	4.25	0.62
a10	<p>When, if ever, was the last occasion you masturbated? That is, aroused yourself sexually?</p> <p>1. In the past 7 days 2. Before 7 days and 4 weeks ago 3. Between 4 weeks and 6 months ago 4. Between 6 months and 1 year ago 5. Between 1 year and 5 years ago 6. Longer than 5 years ago 7. Never masturbated or aroused myself sexually</p>	4.00	1.10
a11	About how much do you weight without shoes?	4.08	1.31
b1	<p>Do you consider yourself now to be...</p> <p>1. Overweight</p>	3.73	1.35

	2. Underweight 3. About the right weight		
b2	Are you now taking medicine or receiving treatment from a doctor or other health professional for any type of mental health condition or emotional problem?  1. Yes 2. No	3.62	1.04
b3	In the past 30 days, how often have you visited a web site for sexually explicit material?  1. Never 2. 1-2 times 3. 3-5 times 4. More than 5 times	4.17	0.83
b4	Being 'booked' means that you were taken into custody and processed by the police or by someone connected with the courts, even if you were then released. In the past 12 months, were you arrested and booked for drunkenness or other liquor law violations?  1. Yes 2. No	3.67	1.37
b5	Think specifically about the past 30 days. During the past 30 days, on how many days did you drink one or more drinks of an alcoholic beverage?	4.00	0.95
b6	On how many of the past 30 days did you smoke part or all of a cigar with marijuana in it?	3.58	1.00
b7	The next question asks about the use of tranquilizers. Tranquilizers are usually prescribed to relax people, to calm people down, to relieve anxiety, or to relax muscle spasms. Some people call tranquilizers 'nerve pills.' We are interested in your use of any prescription tranquilizers that were not prescribed for you, or that you took only for the experience or feeling they caused. Have you ever, even once, used any tranquilizers that was not prescribed for you or that you took only for the experience or feeling it caused? Such as Klonopin, Clonazepam, Xanax, Alprazolam, Ativan, Lorazepam, Valium or Diazepam.  1. Yes	4.00	1.18



	2. No		
b8	<p>MALE: Think back to the very first time you had vaginal intercourse with a female. If this first vaginal intercourse was not voluntary, that is, you did not choose to have sex of your own free will. Were you physically hurt or injured?</p> <p>1. Yes 2. No</p> <p>FEMALE: Think back to the very first time you had vaginal intercourse with a male. If this first vaginal intercourse was not voluntary, that is, you did not choose to have sex of your own free will. Were you physically hurt or injured?</p> <p>1. Yes 2. No</p>	3.55	1.21
b9	<p>MALE: Think back to the very first time you had vaginal intercourse with a female. If this first vaginal intercourse was not voluntary, that is, you did not choose to have sex of your own free will. Were you physically held down?</p> <p>1. Yes 2. No</p> <p>FEMALE: Think back to the very first time you had vaginal intercourse with a male. If this first vaginal intercourse was not voluntary, that is, you did not choose to have sex of your own free will. Were you physically held down?</p> <p>1. Yes 2. No</p>	3.75	1.22
b10	<p>MALE: Thinking about the last 12 months, how many female sex partners have you had in the 12 months? Please count every partner, even those you had sex with only once in those 12 months.</p> <p>FEMALE: Thinking about the last 12 months, how many male sex partners have you had in the 12 months? Please count every partner, even those you had sex with only once in those 12 months.</p>	3.91	0.70
b11	MALE: Has another male ever performed oral sex on you, that is, stimulated your	3.92	1.31

	penis with his mouth?		
	1. Yes		
	2. No		
	FEMALE: Has another female ever performed oral sex on you?		
	1. Yes		
	2. No		
c1	On how many days in the past 12 months did you drink an alcoholic beverage?	3.83	1.03
c2	On average, how many days did you drink an alcoholic beverage each month during the past 12 months?	3.50	1.24
c3	On average, how many days did you drink an alcoholic beverage each week during the past 12 months?	4.00	0.82
c4	During the past 12 months, have you driven a vehicle while you were under the influence of alcohol?	4.33	0.89
	1. Yes		
	2. No		
c5	How long has it been since you last used marijuana or hashish?	3.69	1.38
	1. Within the past 30 days		
	2. More than 30 days ago but within the past 12 months		
	3. More than 12 months ago		
	4. Never used marijuana or hashish		
c6	The next question is about marijuana and hashish. Marijuana is also called pot or grass. Marijuana is usually smoked, either in cigarettes, called joints, or in a pipe. It is sometimes cooked in food. Hashish is a form of marijuana that is also called "hash." It is usually smoked in a pipe. Another form of hashish is hash oil. On average, how many days did you use marijuana or hashish each month during the past 12 months?	3.58	1.24
c7	The next question is about marijuana and hashish. Marijuana is also called pot or grass. Marijuana is usually smoked, either in cigarettes, called joints, or in a pipe. It is sometimes cooked in food. Hashish is a form of marijuana that is also called "hash." It is usually smoked in a pipe. Another form of hashish is hash oil. On average, how	3.73	1.10

	many days did you use marijuana or hashish each week during the past 12 months?		
c8	Tranquilizers are usually prescribed to relax people, to calm people down, to relieve anxiety, or to relax muscle spasms. Some people call tranquilizers 'nerve pills.' On how many days in the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?	3.83	1.03
c9	Tranquilizers are usually prescribed to relax people, to calm people down, to relieve anxiety, or to relax muscle spasms. Some people call tranquilizers 'nerve pills.' On average, how many days each month during the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?	3.55	1.04
c10	Tranquilizers are usually prescribed to relax people, to calm people down, to relieve anxiety, or to relax muscle spasms. Some people call tranquilizers 'nerve pills.' On average, how many days each week during the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?	3.82	0.75
c11	The first time this occurred, how old were you?	3.91	1.14
c12	MALE: The first time this occurred, how old was she?  FEMALE: The first time this occurred, how old was he?	3.55	1.13
c13	MALE: Did you use a condom the last time a female performed oral sex on you?  1. Yes 2. No  FEMALE: Was a condom used the last time you performed oral sex on a male? By oral sex, we mean stimulating the genitals with the mouth.  1. Yes 2. No	3.75	1.14

c14	<p>MALE: Have you ever put your penis in a female's rectum or butt (also known as anal sex)?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol> <p>FEMALE: Has a male ever put his penis in your rectum or butt (also known as anal sex)?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	3.58	0.90
c15	<p>MALE: As you know, some people have had sexual intercourse by your age and others have not. What would you say is the most important reason why you have not had sexual intercourse up to now?</p> <ol style="list-style-type: none"> <li>1. Against religion or morals</li> <li>2. Don't want to get a female pregnant</li> <li>3. Don't want to get a sexually transmitted disease</li> <li>4. Haven't found the right person yet</li> <li>5. In a relationship, but waiting for the right time</li> <li>6. Other</li> </ol> <p>FEMALE: As you know, some people have had sexual intercourse by your age and others have not. What would you say is the most important reason why you have not had sexual intercourse up to now?</p> <ol style="list-style-type: none"> <li>1. Against religion or morals</li> <li>2. Don't want to get pregnant</li> <li>3. Don't want to get a sexually transmitted disease</li> <li>4. Haven't found the right person yet</li> <li>5. In a relationship, but waiting for the right time</li> <li>6. Other</li> </ol>	3.67	1.72
c16	<p>MALE: Think back to the very first time you had vaginal intercourse with a female. If this first vaginal intercourse was not voluntary, that is, you did not choose to have sex of your own free will. Did you do what she said because she was bigger than you or a grown-up, and you were young?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol> <p>FEMALE: Think back to the very first time you had vaginal intercourse with a male. If</p>	3.73	1.10

	<p>this first vaginal intercourse was not voluntary, that is, you did not choose to have sex of your own free will. Did you do what he said because he was bigger than you or a grown-up, and you were young?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>		
c17	<p>MALE: Think back to the very first time you had vaginal intercourse with a female. If this first vaginal intercourse was not voluntary, that is, you did not choose to have sex of your own free will. Were you threatened with physical hurt or injury?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol> <p>FEMALE: Think back to the very first time you had vaginal intercourse with a male. If this first vaginal intercourse was not voluntary, that is, you did not choose to have sex of your own free will. Were you threatened with physical hurt or injury?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	3.50	1.45
c18	<p>MALE: Besides the time you already reported, have you ever been forced by a female to have vaginal intercourse against your will?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol> <p>FEMALE: Besides the time you already reported, have you ever been forced by a male to have vaginal intercourse against your will?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	3.64	1.36
c19	<p>MALE: In the last 12 months, did you have sex with any females who were also having sex with other people at around the same time?</p> <p>FEMALE: In the last 12 month, did you have sex with any males who were also having sex with other people at around the same time?</p>	3.67	1.30
c20	MALE: The next questions ask about sexual experiences you may have had with another	3.50	1.31

	<p>male. Have you ever performed oral sex on another male, that is, stimulated his penis with your mouth?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol> <p>FEMALE: The next questions ask about sexual experiences you may had with another female. Have you ever performed oral sex on another female?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>		
c21	<p>During the past 30 days, how often did you feel hopeless? Would you say...</p> <ol style="list-style-type: none"> <li>1. All of the time</li> <li>2. Most of the time</li> <li>3. Some of the time</li> <li>4. A little of the time</li> <li>5. None of the time</li> </ol>	3.55	1.21
ACASI Filter Question 1	<p>Now think about the past 12 months. We want to know how many days you've had a drink of an alcoholic beverage during the past 12 months. What would be the easiest way for you to tell us how many days you drank alcoholic beverages?</p> <ol style="list-style-type: none"> <li>1. Average number of days per week during the past 12 months</li> <li>2. Average number of days per month during the past 12 months</li> <li>3. Total number of days during the past 12 months</li> </ol>	2.73	1.19
ACASI Filter Question 2	<p>Now think about the past 12 months. We want to know how many days you have used any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused during the past 12 months. What would be the easiest way for you to tell us how many days you used a prescription tranquilizer in either of these ways?</p> <ol style="list-style-type: none"> <li>1. Average number of days per week during the past 12 months</li> <li>2. Average number of days per month during the past 12 months</li> <li>3. Total number of days during the past 12 months</li> </ol>	3.15	1.21

ACASI Marijuana	The next question is about marijuana and hashish. Marijuana is also called pot or grass. Marijuana is usually smoked, either in cigarettes, called joints, or in a pipe. It is sometimes cooked in food. Hashish is a form of marijuana that is also called “hash.” It is usually smoked in a pipe. Another form of hashish is hash oil. On how many days in the past 12 months did you use marijuana or hashish?	3.45	1.44
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Note: Question 1 and 78 were introductions not survey questions and were not included in the data analysis.

Appendix B: Estimated Logistic Regression Coefficients for Mode, Rapport, and the Mode by Rapport Interaction for Individual Questions in CAPI or Video-mediated Interviews

**Table 1** The effects of mode, rapport, and the mode by rapport interaction on disclosure to individual questions in CAPI/video-mediated interviews

		<b>Mode: Video-mediated interview</b>	<b>Rapport: High rapport</b>	<b>Interaction: Video-mediated interview × High rapport</b>
<b>Model Type</b>	<b>Survey question</b>	<b>Estimate (SE)</b>	<b>Estimate (SE)</b>	<b>Estimate (SE)</b>
<b>Logistic Regression</b>	Sugar sweetened beverages	0.38 (0.46)	0.59 (0.63)	-0.70 (0.91)
	Sweetened fruit drinks	-0.01 (0.49)	-0.29 (0.61)	-0.71 (0.90)
	Diabetes	-1.75 <sup>^</sup> (1.12)	0.90 (0.74)	0.98 (1.46)
	Hypertension	0.13 (0.57)	0.82 (0.67)	-0.36 (0.97)
	Blood cholesterol checked	-0.07 (1.43)	1.75 <sup>^</sup> (1.26)	-0.63 (1.92)
	High blood cholesterol	0.47 (0.48)	0.97 <sup>^</sup> (0.62)	-0.91 (0.88)
	Sleeping disorder	0.95* (0.46)	0.38 (0.64)	0.43 (0.88)
	Sleeping disorder 2	0.26 (0.79)	1.10 (0.87)	0.18 (1.17)
	Vigorous-intensity sports	0.33 (0.45)	0.54 (0.59)	-0.23 (0.84)
	Moderate-intensity sports	1.15 <sup>^</sup> (0.85)	1.53 <sup>^</sup> (0.96)	-1.55 (1.30)
	Feel nervous in the past 30 days+	-0.29 (0.48)	-0.65 (0.62)	0.47 (0.89)
	Fell restless or fidgety in the past 30 days+	0.74 <sup>^</sup> (0.49)	-0.34 (0.59)	-0.59 (0.86)
	Feel depressed in the past 30 days+	-0.28 (0.46)	-1.98# (1.08)	1.10 (1.36)
	Feel everything was an effort in the past 30 days+	-0.02 (0.43)	0.20 (0.59)	-1.10 <sup>^</sup> (0.84)
	Feel down on yourself in the past 30 days +	-0.16 (0.42)	-0.13 (0.58)	-0.95 (0.91)
	A month in the past 12 months felt more emotionally stressed	0.34 (0.43)	0.38 (0.59)	0.15 (0.88)
	Feel restless or fidgety in the past 12 months+	-0.38 (0.79)	-1.01 (0.91)	1.80 (1.47)
	Feel depressed in the past 12 months+	0.14 (0.56)	-0.97 <sup>^</sup> (0.75)	-0.68 (1.07)
	Feel down on yourself in the past 12 months+	-0.35 (0.57)	-0.94 (0.74)	-0.16 (1.03)
	Feel hopeless in the past 12 months+	0.43 (0.79)	0.54 (1.35)	-3.21# (1.80)
	Current treatment for mental health	1.30 (1.16)	1.79 <sup>^</sup> (1.30)	-0.45 (1.68)



condition			
Voting (House of Representatives in Washington)	0.66 (0.53)	-0.38 (0.86)	-0.51 (1.20)
Binge drinking in the past 30 days++	0.29 (0.52)	0.14 (0.71)	-0.67 (1.02)
Had more than 1 drink each day during the past 30 days ++	0.71 (0.68)	-0.09 (0.89)	-0.20 (1.23)
Ever smoked a cigarette	0.52 (0.42)	1.22# (0.64)	-0.60 (0.92)
Smoked a cigarette in the past 30 days	0.14 (0.96)	-0.18 (1.28)	0.73 (1.61)
Ever used snuff	0.22 (0.53)	-0.48 (0.85)	-0.15 (1.19)
Ever had chewing tobacco	0.34 (0.63)	-0.69 (1.13)	0.49 (1.42)
Ever smoked a cigar	-0.10 (0.42)	-0.58 (0.58)	0.45 (0.82)
Ever used marijuana or hashish	0.35 (0.44)	0.20 (0.59)	-0.17 (0.86)
Ever smoked a cigar with marijuana in it	-0.60 (0.61)	-0.48 (0.85)	-0.10 (1.42)
Nonmedical use of prescription tranquilizer	0.11 (1.45)	1.90^ (1.31)	-0.52 (1.84)
Nonmedical use of prescription tranquilizer 2	0.97 (1.19)	0.97 (1.47)	0.71 (1.84)
Condom used the last time had vaginal intercourse	0.39 (0.46)	0.10 (0.60)	0.10 (0.90)
Ever had any homosexual experience	-0.61 (0.54)	-0.41 (0.72)	1.64# (0.98)
Used condom the last time had any type of sex	0.13 (0.66)	0.69 (0.94)	1.07 (1.48)
Number of sex partners of the opposite sex (medium)++	0.52 (0.65)	0.41 (0.84)	0.47 (1.17)
Number of sex partners of the opposite sex in the last 12 months (medium)++	0.15 (0.62)	-0.07 (0.85)	0.95 (1.31)
Bought fair trade goods or anything in a charity shop in the past 12 months	0.21 (0.46)	0.29 (0.60)	-1.07 (0.94)
Attended church, synagogue, or mosque almost every week in the past 12 months	0.84# (0.50)	0.85 (0.71)	-1.87#(0.96)
Given money or good	0.29 (0.43)	0.34 (0.58)	-0.42 (0.82)

	s to the homeless in the past 12 months			
	Ever been arrested or booked for breaking the law	0.94 (0.86)	1.05 (1.04)	-1.63 (1.54)
<b>Ordinal Logistic Regression</b>	First time had an alcoholic drink++	-0.03 (0.39)	0.09 (0.52)	0.40 (0.74)
	The Largest number of drinks in the past 30 days++	0.39 (0.42)	0.56 (0.57)	-0.30 (0.81)
	How long since last alcoholic drink	-0.12 (0.57)	-0.10 (0.76)	0.50 (1.13)
	Days drank one or more alcoholic drinks in the past 30 days++	-0.51 (0.40)	-0.98# (0.57)	1.47# (0.78)
	How often visited a web site for sexually explicit material in the past 30 days	-0.31 (0.43)	-0.43 (0.60)	-1.50 (1.22)
<b>Multinomial Logistic Regression</b>	Better off or worse off financially than a year ago	-0.48 (0.50)	-0.55 (0.71)	0.05 (1.11)
	A year from now will be better off or worse off financially	1.09* (0.43)	0.36 (0.57)	-0.61 (0.81)
	Good times or bad times financially for business conditions in the next 12 months	1.02* (0.49)	0.63 (0.66)	-0.52 (0.87)
	Economic policy of the government	-0.16 (0.43)	-0.53 (0.59)	0.18 (0.83)
	Income expectation in the next 12 months	1.31* (0.54)	0.71 (0.73)	-1.49^(1.00)
	Income increase in the next five years or so++	0.94* (0.40)	1.02 #(0.53)	-0.67 (0.75)
	Health in general	0.14 (0.39)	0.57 (0.54)	-0.92 (0.77)
	Overall diet	-0.24 (0.39)	0.87^ (0.54)	-1.21^(0.78)

Note: Reference categories for predictors are: Mode (CAPI) and Rapport (Low).

Models are presented by the type of responses: logistic regression models for yes/no responses, ordinal logistic regression models for ordered response scales, multinomial logistic regression models for nominal response scales.

Due to Quasi-complete separation, logistic regression was not performed on seventeen questions.

+Ordinal outcome variable (All of the time; Most of the time; Some of the time; A little of the time; and None of the time) recoded into binary variable (Yes and No)

++Continuous outcome variable that is not normally distributed and therefore recoded into binary, ordinal or nominal variables depending on the distribution.

^p<0.20; #p<0.10; \*p<0.05

## Appendix C: Probability of Disclosure given Question Topics in CAPI/Video-mediated Interviews

**Table 1** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with mode, rapport, the mode by rapport interaction, and random effects associated with respondent intercepts (Health Conditions)

Parameter	Category	Estimate	SE	DF	t Value
Intercept	Intercept	-1.28	0.13	121	-9.78***
Mode	Video-mediated Interview	0.17	0.18	121	0.94
Rapport	High	0.46	0.24	121	1.95#
Mode × Rapport	Video-mediated Interview × High Rapport	-0.32	0.34	121	-0.95
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.25	0.09		

Note: Reference categories for predictors are: Mode (CAPI) and Rapport (low-rapport interview)

The estimation method is Residual Pseudo Likelihood.

#p<0.10; \*p<0.05

**Table 2** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with mode, rapport, the mode by rapport interaction, and random effects associated with respondent intercepts (Mental Health)

Effect	Category	Estimate	SE	DF	t Value
Intercept	Intercept	0.30	0.17	121	1.73#
Mode	Video-mediated Interview	0.07	0.24	121	0.29
Rapport	High	-0.22	0.33	121	-0.66
Mode × Rapport	Video-mediated Interview × High Rapport	-0.34	0.46	121	-0.73
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.83	0.19		

Note: Reference categories for predictors are: Mode (CAPI) and Rapport (low-rapport interview)

The estimation method is Residual Pseudo Likelihood.

#p<0.10; \*p<0.05

**Table 3** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with mode, rapport, the mode by rapport interaction, and random effects associated with respondent intercepts (Religion and Voting)

Parameter	Category	Estimate	SE	DF	t Value
Intercept	Intercept	-2.23	0.29	121	-7.72***
Mode	Video-mediated Interview	0.36	0.39	121	0.91
Rapport	High	-0.15	0.56	121	-0.27
Mode × Rapport	Video-mediated Interview × Rapport	-1.09	0.92	121	-1.19
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		1.09	0.38		

Note: Reference categories for predictors are: Mode (CAPI) and Rapport (low-rapport interview)

The estimation method is Residual Pseudo Likelihood.

#p<0.10; \*p<0.05

**Table 4** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with mode, rapport, the mode by rapport interaction, and random effects associated with respondent intercepts (Consumer Finance)

Parameter	Category	Estimate	SE	DF	t Value
Intercept	Intercept	-1.88	0.20	121	-9.43***
Mode	Video-mediated Interview	0.60	0.26	121	2.30*
Rapport	High	0.40	0.35	121	1.13
Mode × Rapport	Video-mediated Interview × High Rapport	-0.30	0.48	121	-0.62
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.32	0.18		

Note: Reference categories for predictors are: Mode (CAPI) and Rapport (low-rapport interview)

The estimation method is Residual Pseudo Likelihood.

#p<0.10; \*p<0.05

**Table 5** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with mode, rapport, the mode by rapport interaction, and random effects associated with respondent intercepts (Alcohol Consumption)

Parameter	Category	Estimate	SE	DF	t Value
Intercept	Intercept	-0.05	0.12	121	-0.42
Mode	Video-mediated Interview	0.20	0.17	121	1.21
Rapport	High	0.16	0.23	121	0.70
Mode × Rapport	Video-mediated Interview × High Rapport	-0.09	0.32	121	-0.27
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.01	0.08		

Note: Reference categories for predictors are: Mode (CAPI) and Rapport (low-rapport interview)

The estimation method is Residual Pseudo Likelihood.

#p<0.10; \*p<0.05

**Table 6** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with mode, rapport, the mode by rapport interaction, and random effects associated with respondent intercepts (Use of Tobacco Products)

Parameter	Category	Estimate	SE	DF	t Value
Intercept	Intercept	-0.90	0.14	121	-6.57***
Mode	Video-mediated Interview	0.16	0.19	121	0.82
Rapport	High	0.01	0.26	121	0.05
Mode × Rapport	Video-mediated Interview × High Rapport	-0.02	0.37	121	-0.06
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.18	0.11		

Note: Reference categories for predictors are: Mode (CAPI) and Rapport (low-rapport interview)

The estimation method is Residual Pseudo Likelihood.

#p<0.10; \*p<0.05

**Table 7** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with mode, rapport, the mode by rapport interaction, and random effects associated with respondent intercepts (Nonmedical Use of Prescription Drugs)

Parameter	Category	Estimate	SE	DF	t Value
Intercept		-2.87	0.49	121	-5.85***
Mode	Video-mediated Interview	-0.27	0.73	121	-0.37
Rapport	High	1.45	0.70	121	2.06*
Mode × Rapport	Video-mediated Interview × High Rapport	-0.31	1.07	121	-0.29
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		1.02	0.73		

Note: Reference categories for predictors are: Mode (CAPI) and Rapport (low-rapport interview)

The estimation method is Residual Pseudo Likelihood.

#p<0.10; \*p<0.05

**Table 8** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with mode, rapport, the mode by rapport interaction, and random effects associated with respondent intercepts (Sexual Behaviors)

Parameter	Category	Estimate	Standard Error	DF	t Value
Intercept	Intercept	-0.47	0.16	121	-2.98**
Mode	Video-mediated Interview	-0.03	0.22	121	-0.16
Rapport	High	-0.01	0.29	121	-0.04
Mode × Rapport	Video-mediated Interview × High Rapport	0.71	0.41	121	1.72#
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.26	0.14		

Note: Reference categories for predictors are: Mode (CAPI) and Rapport (low-rapport interview)

The estimation method is Residual Pseudo Likelihood.

#p<0.10; \*p<0.05

Appendix D: Summary of the Hypothesis Test Results for the Model Selection in  
Chapter 5 Section 5.4.3

Hypothesis Label	Test Term	Test Statistic Value ( $\chi^2$ )	p-Value
1.1*	Random effects associated with interviewer intercepts	--	
1.2	Random effects associated with respondent intercepts	$\chi^2(1)=42.43$	<0.0001
1.3	Rapport $\times$ Question Position $\times$ Question Sensitivity	$\chi^2(2)=2.8$	0.12
1.4	Mode $\times$ Question Position $\times$ Question Sensitivity	$\chi^2(2)=1.75$	0.21
1.5	Mode $\times$ Rapport $\times$ Question Sensitivity	$\chi^2(1)=0.01$	0.46
1.6	Mode $\times$ Rapport $\times$ Question Position	$\chi^2(2)=1.42$	0.25
1.7	Question Position $\times$ Question Sensitivity	$\chi^2(2)=49.45$	<0.0001
1.8	Rapport $\times$ Question Sensitivity	$\chi^2(1)=0.21$	0.32
1.9	Rapport $\times$ Question Position	$\chi^2(2)=19.03$	<0.0001
1.10	Mode $\times$ Question Sensitivity	$\chi^2(1)=0$	0.50
1.11	Mode $\times$ Question Position	$\chi^2(2)=2.01$	0.18
1.12	Mode $\times$ Rapport	$\chi^2(1)=1.44$	0.12

Note: Likelihood ratio tests with the Laplace estimation method.

Appendix E: Estimated Logistic Regression Coefficients for Vocal Similarity, Rapport, and the Vocal Similarity by Rapport Interaction for Individual Questions in the ACASI Module

**Table 1** The effects of vocal similarity, rapport, and the vocal similarity by rapport interaction on disclosure to individual questions in the ACASI module

		<b>ACASI Voice: Different</b>	<b>Rapport: High rapport</b>	<b>Interaction: Different Voice × High rapport</b>
<b>Model Type</b>	<b>Survey question</b>	<b>Estimate (SE)</b>	<b>Estimate (SE)</b>	<b>Estimate (SE)</b>
<b>Logistic Regression</b>	Drunk driving in the past 12 months	0.68 (0.67)	0.50 (0.92)	0.23 (1.14)
	Ever had marijuana or hashish+	0.02(0.43)	-0.07 (0.61)	0.53 (0.86)
	Ever had oral sex+	0.72 (0.74)	0.74 (1.12)	-0.52 (1.64)
	Ever had anal sex	-0.01 (0.42)	0.87^ (0.62)	-0.91 (0.84)
	Ever performed oral sex on a person of the same sex	0.51 (0.68)	1.66* (0.76)	-1.07 (1.04)
	Have given money or goods to the homeless	-0.44 (0.59)	-0.29 (0.87)	0.44 (1.23)
	Ever had smoked part or all of a cigar with marijuana in it	0.05 (0.87)	0.20 (1.24)	-0.05 (1.76)
	Last time nonmedical use of prescription tranquilizer+	-0.79 (0.92)	0.69 (1.00)	-0.09 (1.65)
	Used condom the very last time had any type of sex	-0.28 (0.66)	-0.75 (0.90)	-0.30 (1.27)
	Number of sexual partners of the opposite sex++	-0.18 (0.60)	0.92 (0.94)	0.18 (1.33)
	Weight++	-0.15 (0.65)	1.18^ (0.89)	-1.93^ (1.48)
	Overweight+	1.47* (0.66)	1.49# (0.87)	-1.42 (1.17)
	Taking medicine or receiving treatment for mental health condition	0.05 (0.88)	-0.10 (1.24)	-0.41 (1.74)
	Ever nonmedical use of prescription tranquilizer	0.05 (1.45)	1.95^ (1.31)	-0.45 (1.84)
	Number of sexual partners of the opposite sex in the last 12 months	-1.04 (0.91)	-0.19 (1.30)	0.08 (1.56)
	Has a person of the same sex ever performed oral sex on you	0.68 (0.81)	1.34^ (0.96)	-1.15 (1.28)
<b>Ordinal Logistic Regression</b>	Felt hopeless during the past 30 days	-0.24 (0.47)	-1.08^ (0.83)	0.49 (1.10)
	The last occasion	0.26 (0.54)	-0.13 (0.78)	-0.19 (1.11)



	masturbated			
	Visited a web site for sexually explicit material in the past 30 days	-0.02 (0.60)	-0.65 (0.89)	0.04 (1.20)
	Days had a drink of an alcoholic beverage during the past 12 months	-0.24 (0.37)	-0.27 (0.53)	1.33# (0.74)
	Age at first vaginal intercourse++	0.16 (0.41)	0.23 (0.56)	0.11 (0.76)
	Partner's age at first vaginal intercourse++	0.25 (0.40)	0.52 (0.55)	-0.27 (0.75)
	Days drank one or more drinks of an alcoholic beverage in the past 30 days	-0.23 (0.55)	0.70 (0.76)	-0.18 (1.01)
<b>Multinomial Logistic Regression</b>	Felt hopeless in the month when at worst emotionally in the past 12 months	-0.13 (0.54)	-0.13 (0.80)	-0.81 (1.23)
	Felt that everything was an effort when at worst emotionally in the past 12 months	-0.86^ (0.54)	-0.58 (0.78)	-0.17 (1.14)

Note: Reference categories for predictors are: ACASI Voice (Same) and Rapport (Low).

^p<0.20 #p<0.10, \*p<0.05

Because of quasi-complete separation of data points, logistic regressions cannot be performed on questions on marijuana or hashish use in the past 12 months; nonmedical use of tranquilizer in the past 12 months; sexual risk behavior; number of drinks each day during the past 30 days; and nonmedical use of prescription pain reliever in the past 12 months

+ Multinomial variable recorded into binary due to zero or small cell sizes.

++The continuous variable was not normally distributed and therefore recorded into multinomial or binary variable

## Appendix F: Probability of Disclosure given Question Topics in the ACASI Module

**Table 1** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with vocal similarity, rapport, the vocal similarity by rapport interaction, and random effects associated with respondent intercepts (Alcohol Consumption)

Parameter	Category	Estimate	SE	DF	t Value
Intercept	Intercept	-0.2579	0.2296	121	-1.12
Vocal Similarity	Different	-0.1568	0.3290	121	-0.48
Rapport	High	-0.3464	0.4742	121	-0.73
Vocal Similarity × Rapport	Different Voice× High Rapport	1.3011	0.6554	121	1.99*
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.84	0.41		

Note: Reference categories for predictors are ACASI Voice (different) and Rapport (low-rapport interview)

The estimation method is Laplace

#p<0.10, \*p<0.05

**Table 2** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with vocal similarity, rapport, the vocal similarity by rapport interaction, and random effects associated with respondent intercepts (Use of Marijuana and Tranquilizer)

Parameter	Category	Estimate	SE	DF	t Value
Intercept	Intercept	-0.9740	0.2095	121	-4.65***
Vocal Similarity	Different	-0.1366	0.2889	121	-0.47
Rapport	High	0.3427	0.3944	121	0.87
Vocal Similarity × Rapport	Different Voice× High Rapport	0.1198	0.5466	121	0.22
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.25	0.22		

Note: Reference categories for predictors are ACASI Voice (different) and Rapport (low-rapport interview)

The estimation method is Laplace

#p<0.10, \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

**Table 3** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with vocal similarity, rapport, the vocal similarity by rapport interaction, and random effects associated with respondent intercepts (Sexual Behaviors)

Parameter	Category	Estimate	SE	DF	t Value
Intercept	Intercept	-0.4051	0.1130	119	-3.59***
Voice	Different	0.1719	0.1595	119	1.08
Rapport	High	0.3900	0.2206	119	1.77#
ACASI Voice × Rapport	Different Voice× High Rapport	-0.4102	0.3027	119	-1.36
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.08	0.07		

Note: Reference categories for predictors are ACASI Voice (different) and Rapport (low-rapport interview)

The estimation method is Laplace

#p<0.10, \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

**Table 4** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure with vocal similarity, rapport, the vocal similarity by rapport interaction, and random effects associated with respondent intercepts (Mental Health, Weight, and Others)

Parameter	Category	Estimate	SE	DF	t Value
Intercept	Intercept	-0.6404	0.3255	119	-1.97#
Vocal Similarity	Different	-0.2351	0.4514	119	-0.52
Rapport	High	-0.6635	0.6580	119	-1.01
Vocal Similarity × Rapport	Different Voice× High Rapport	-0.4020	0.9257	119	-0.43
Covariance Parameters		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		2.00	0.87		

Note: Reference categories for predictors are ACASI Voice (different) and Rapport (low-rapport interview)

The estimation method is Laplace

#p<0.10, \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Appendix G: Summary of the Hypothesis Test Results for the Model Selection in  
Chapter 6 Section 6.4

Hypothesis Label	Test Term	Test Statistic Value ( $\chi^2$ )	p-Value
1.1*	Random effects associated with interviewer intercepts	--	
1.2	Random effects associated with respondent intercepts	$\chi^2(1)=7.13$	0.004
1.3	Vocal Similarity $\times$ Question Position $\times$ Question Sensitivity	$\chi^2(1)=0.01$	0.46
1.4	Vocal Similarity $\times$ Questionnaire Version $\times$ Question Sensitivity	$\chi^2(1)=0.14$	0.35
1.5	Rapport $\times$ Question Position $\times$ Question Sensitivity	$\chi^2(1)=1.86$	0.09
1.6	Rapport $\times$ Questionnaire Version $\times$ Question Sensitivity	$\chi^2(1)=0.18$	0.34
1.7	Rapport $\times$ Vocal Similarity $\times$ Question Sensitivity	$\chi^2(1)=1.98$	0.08
1.8	Mode $\times$ Question Position $\times$ Question Sensitivity	$\chi^2(1)=1.28$	0.13
1.9	Mode $\times$ Questionnaire Version $\times$ Question Sensitivity	$\chi^2(1)=0.28$	0.30
1.10	Mode $\times$ Vocal Similarity $\times$ Question Sensitivity	$\chi^2(1)=0.49$	0.24
1.11	Mode $\times$ Rapport $\times$ Questionnaire Sensitivity	$\chi^2(1)=2.92$	0.04
1.12	Vocal Similarity $\times$ Questionnaire Version $\times$ Question Position	$\chi^2(1)=3.58$	0.03
1.13	Rapport $\times$ Questionnaire Version $\times$ Question Position	$\chi^2(1)=0$	0.50
1.14	Rapport $\times$ Vocal Similarity $\times$ Question Position	$\chi^2(1)=0.25$	0.31
1.15	Rapport $\times$ Vocal Similarity $\times$ Questionnaire Version	$\chi^2(1)=0.46$	0.25
1.16	Mode $\times$ Questionnaire Version $\times$ Question Position	$\chi^2(1)=0.89$	0.17
1.17	Mode $\times$ Vocal Similarity $\times$ Question Position	$\chi^2(1)=0.1$	0.38
1.18	Mode $\times$ Vocal Similarity $\times$ Questionnaire Version	$\chi^2(1)=0.6$	0.22
1.19	Mode $\times$ Rapport $\times$ Question Position	$\chi^2(1)=1.64$	0.10
1.20	Mode $\times$ Rapport $\times$ Questionnaire Version	$\chi^2(1)=1.01$	0.16
1.21	Mode $\times$ Rapport $\times$ Vocal Similarity	$\chi^2(1)=0.36$	0.27
1.22**	Question Position $\times$ Question Sensitivity	--	--
1.23**	Questionnaire Version $\times$ Question Sensitivity	--	--
1.24	Vocal Similarity $\times$ Question	$\chi^2(1)=0.43$	0.26

	Sensitivity		
1.25**	Rapport × Question Sensitivity	--	--
1.26**	Mode × Question Sensitivity	--	--
1.27**	Questionnaire Version × Question Position	--	--
1.28**	Vocal Similarity × Question Position	--	--
1.29**	Vocal Similarity × Questionnaire Version	--	--
1.30	Rapport × Question Position	$\chi^2(1)=2.18$	0.07
1.31	Rapport × Questionnaire Version	$\chi^2(1)=2.03$	0.08
1.32	Rapport × Vocal Similarity	$\chi^2(1)=0.19$	0.33
1.33	Mode × Question Position	$\chi^2(1)=4.08$	0.02
1.34	Mode × Questionnaire Version	$\chi^2(1)=0.25$	0.31
1.35	Mode × Vocal Similarity	$\chi^2(1)=1.24$	0.13
1.36**	Mode × Rapport	--	--

Note: Likelihood ratio tests with the Laplace estimation method.

\*The variance components for random effects associated with interviewer intercepts were estimated to be zero.

\*\* The -2 log likelihood statistic was the same for the model with or without the test term, indicating no improvement.

## Appendix H: Sensitivity Test with the Model in Chapter 6 Section 6.4

Three significant three-way interactions were found in the final model given in Chapter 6 Section 6.4. Responses to open-ended questions in ACASI were recorded into binary variables and then used as the dependent variable in the multilevel multinomial logistic regression to predict disclosure. In order to see whether the findings on the three-way interactions were related to the recoding of particular questions, I conducted a sensitivity test where the responses to questions A4, A6, A9, A11, and B5, B6, B10 were removed from the analysis. Similar patterns on disclosure were found with the three three-way interactions in the sensitivity test, suggesting it was not related to the recording of particular questions.

Table 1 presents the parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure in ACASI using random effects associated with respondent intercepts for the sensitivity test. Figure 1, 2, and 3 present the effects of the three three-way interactions on disclosure for the final model in Chapter 6 Section 6.4. Figure 4, 5, and 6 present the effects of the three three-way interactions on disclosure for the sensitivity test.

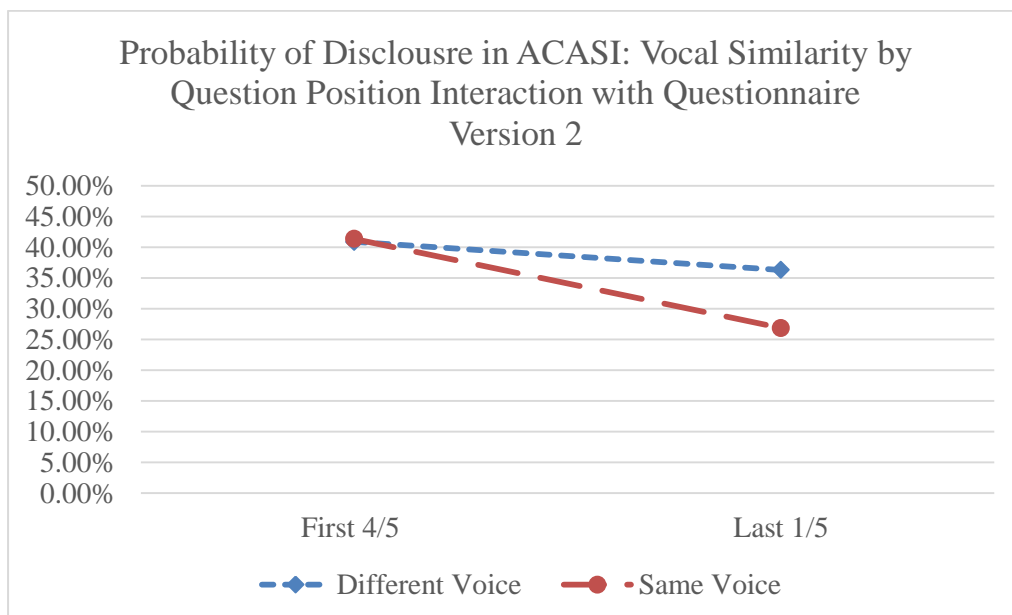
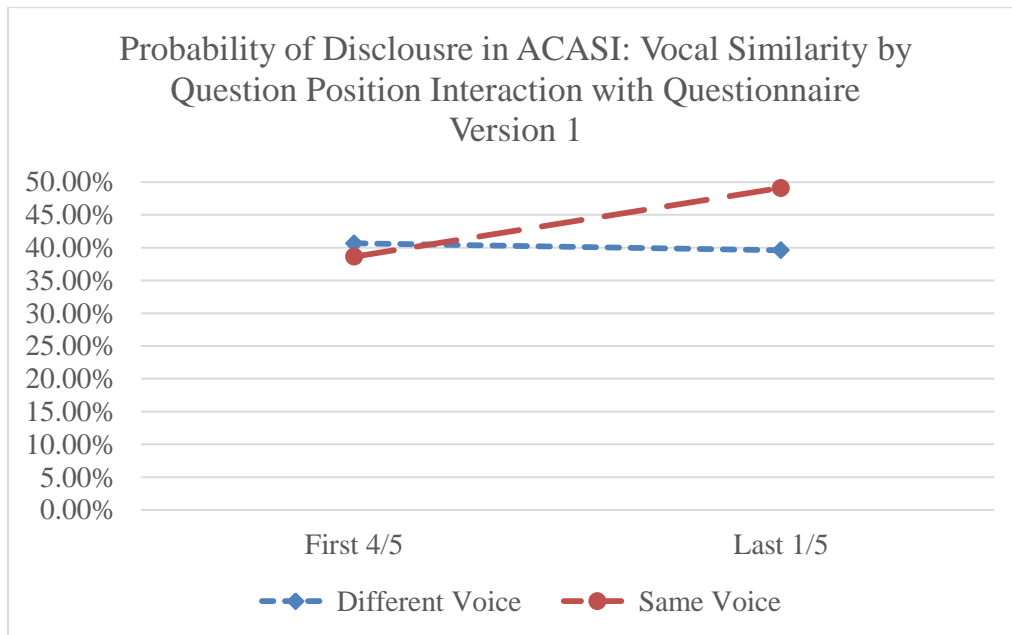
**Table 1** Parameter estimates in the multilevel multinomial logistic regression model, predicting the probability of disclosure in ACASI using random effects associated with respondent intercepts for the sensitivity test

Parameter	Category	Estimate	SE	t Value	DF
Intercept	Intercept	-0.90	0.20	-4.43***	118
Mode	Video-mediated Interviews	-0.16	0.22	-0.72	118
Rapport	High	-0.22	0.27	-0.82	118
Vocal Similarity	Different	0.06	0.19	0.32	118
Questionnaire Version	Version 2	0.01	0.25	0.06	118
Question Position	Last 1/6 or 1/7	0.86	0.27	3.15**	118
Question Sensitivity	High	0.40	0.20	2.00*	120
Mode × Rapport	Video-mediated Interviews × High Rapport	0.67	0.39	1.73	118
Mode × Question Position	Video-mediated Interview × Last 1/6 or 1/7	-0.30	0.25	-1.20	118
Vocal Similarity × Questionnaire Version	Different Voice × Version 2	0.01	0.27	0.03	118
Vocal Similarity × Question Position	Different Voice × Last 1/6 or 1/7	-0.46	0.31	-1.48	118
Questionnaire Version × Question Position	Version 2 × Last 1/6 or 1/7	-1.65	0.43	-3.80**	118
Mode × Question Sensitivity	Video-mediated Interview × High Sensitivity	0.19	0.24	0.82	120
Rapport × Question Sensitivity	High Rapport × High Sensitivity	0.45	0.31	1.46	120
Questionnaire Version × Question Sensitivity	Version 2 × High Sensitivity	0.01	0.23	0.03	120
Question Position × Question Sensitivity	Last 1/6 or 1/7 × High Sensitivity	0.60	0.35	1.70	121
Vocal Similarity × Questionnaire Version × Question Position	Different Voice × Version 2 × Last 1/6 or 1/7	0.83	0.50	1.67	118
Mode × Rapport × Question Sensitivity	Video-mediated Interview × High Rapport × High Sensitivity	-0.67	0.44	-1.52	120
Questionnaire Version × Question Position × Question Sensitivity	Version 2 × Last 1/6 or 1/7 × High Sensitivity	0.50	0.53	0.94	121
Covariance Parameter		Estimate	SE		
$\sigma^2_{\text{int:respondent}}$		0.20	0.07		

Note: \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

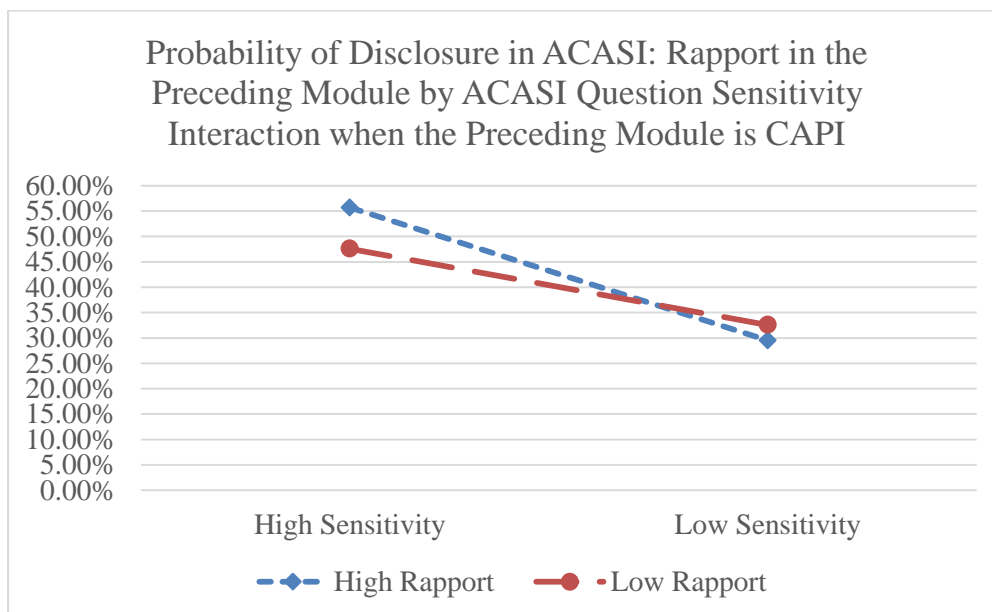
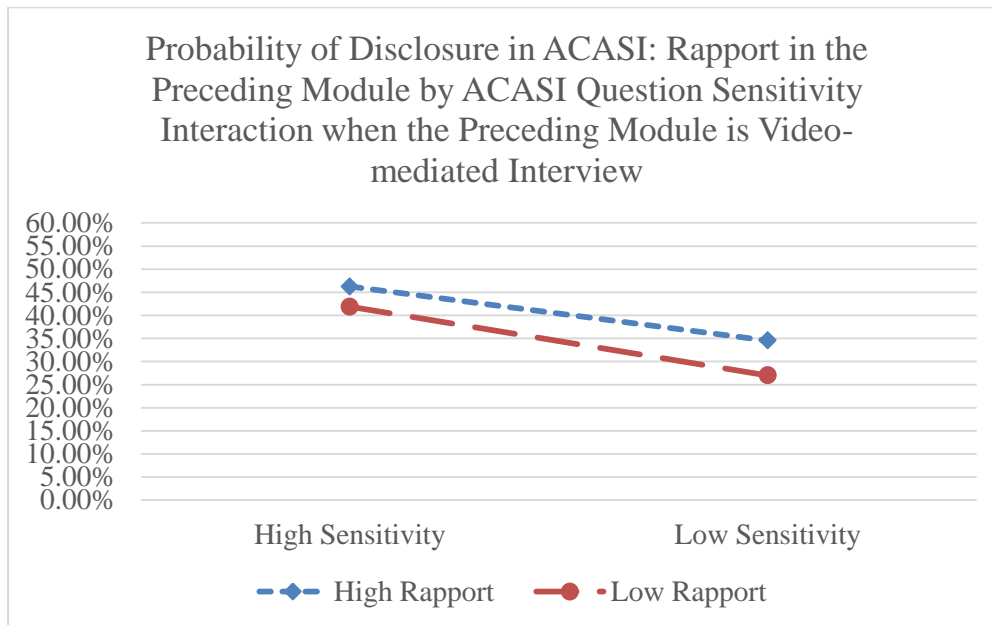
$\sigma^2_{\text{int:respondent}}$  refers to random effects associated with respondent intercepts

**Figure 1.** The Effects of the Vocal Similarity by Question Position by Questionnaire Version Interactions on Disclosure for the Final Model in Chapter 6 Section 6.4

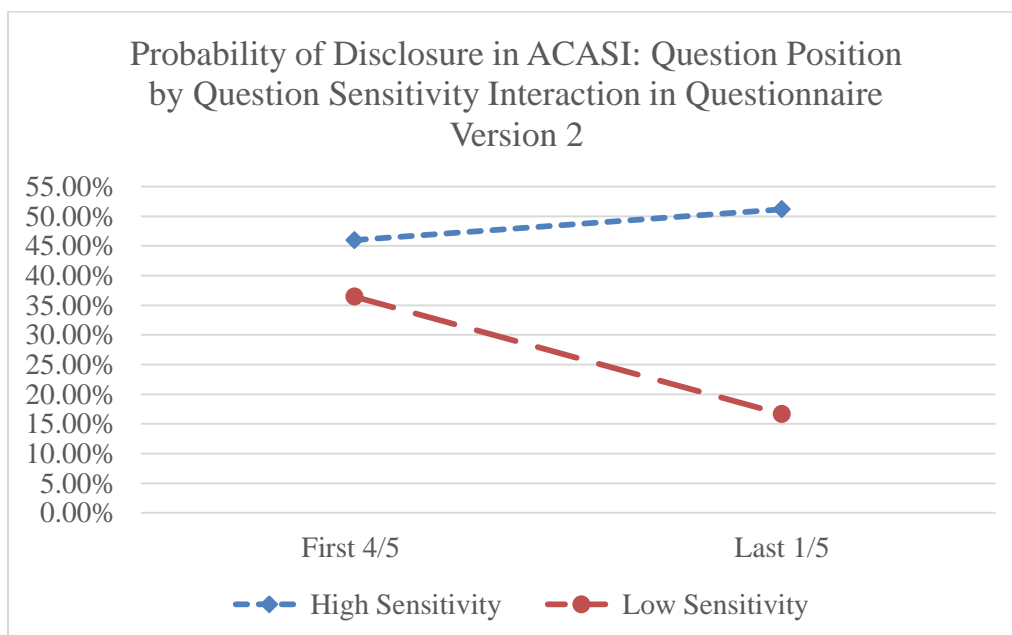
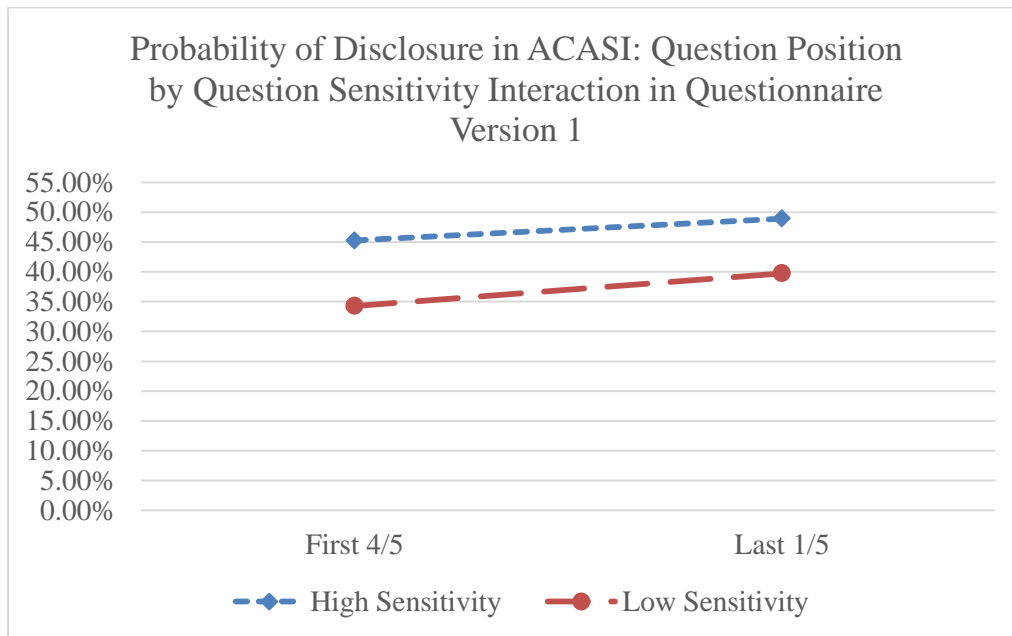




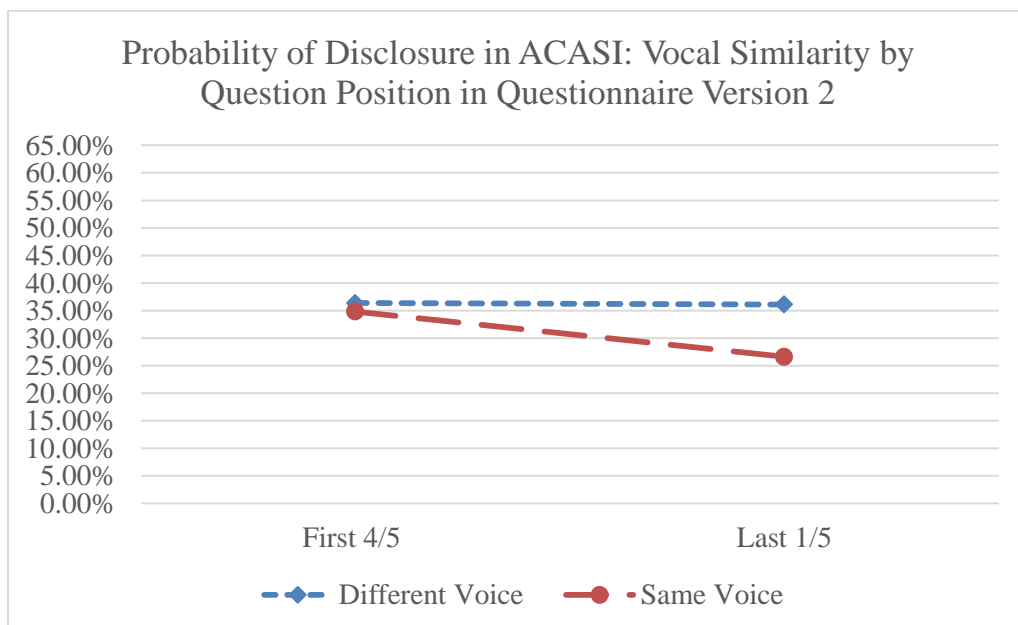
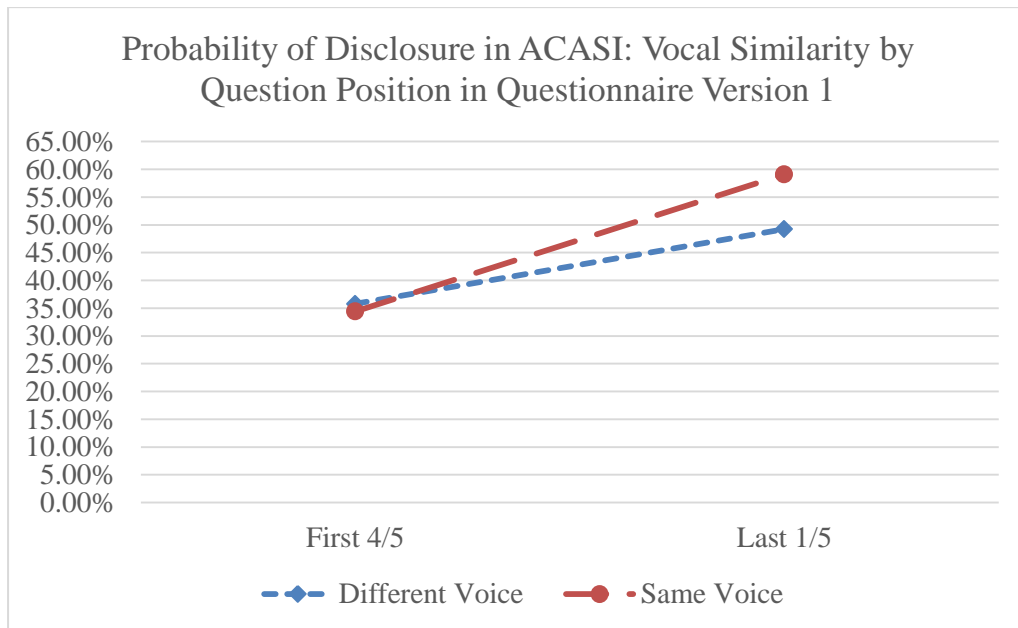
**Figure 2.** The Effects of the Mode in Preceding Module by Rapport in Preceding Module by Question Sensitivity Interactions on Disclosure for the Final Model in Chapter 6 Section 6.4



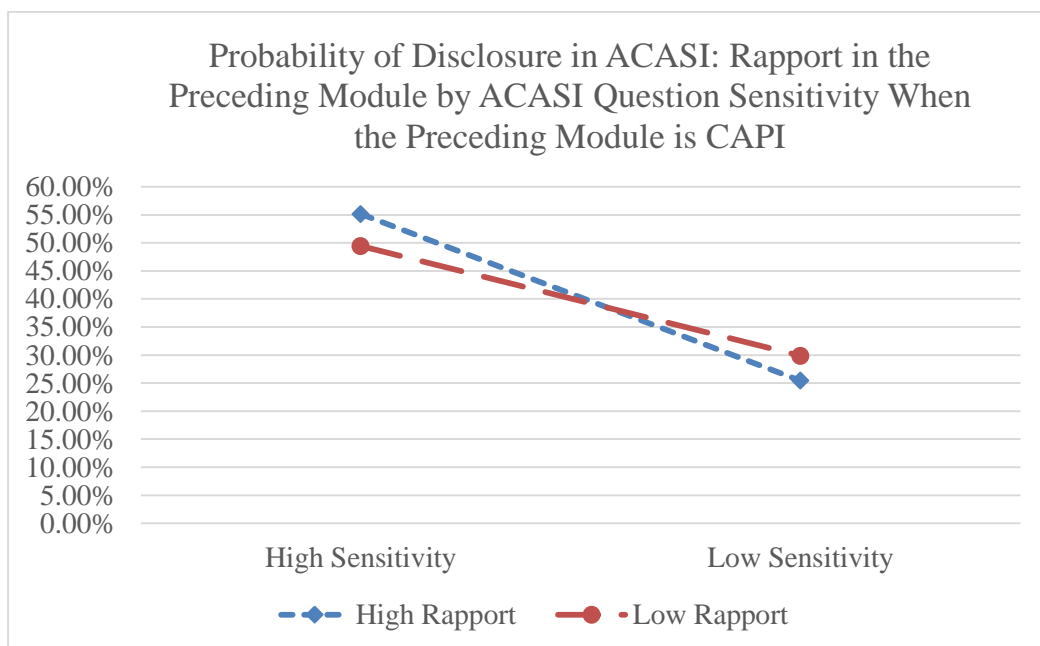
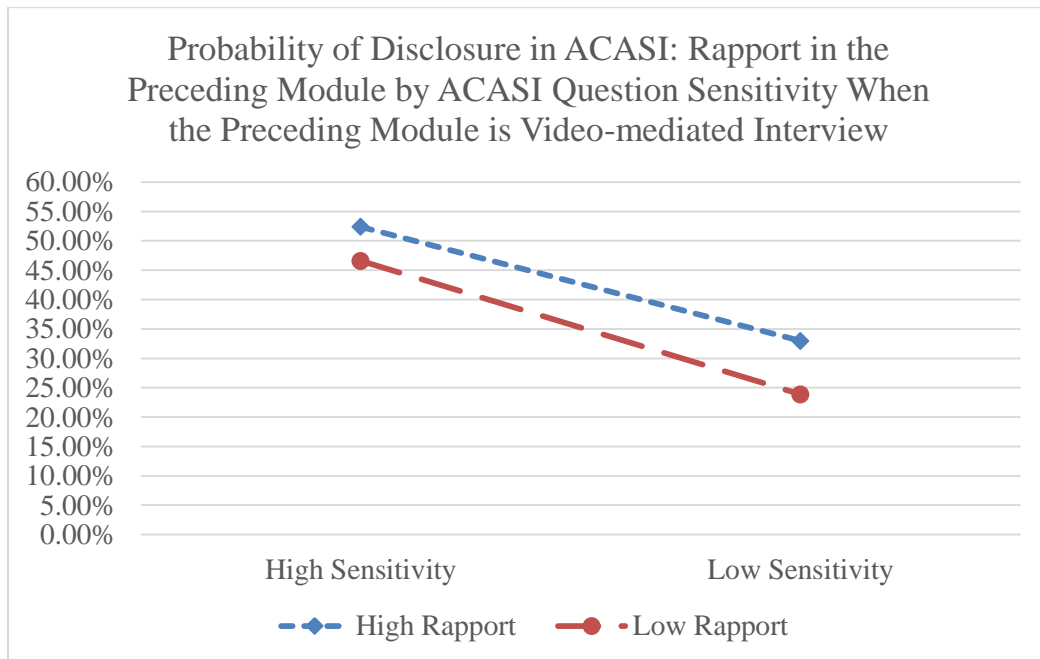
**Figure 3.** The Effects of the Question Position by Question Sensitivity by Questionnaire Version Interactions on Disclosure for the Final Model in Chapter 6 Section 6.4



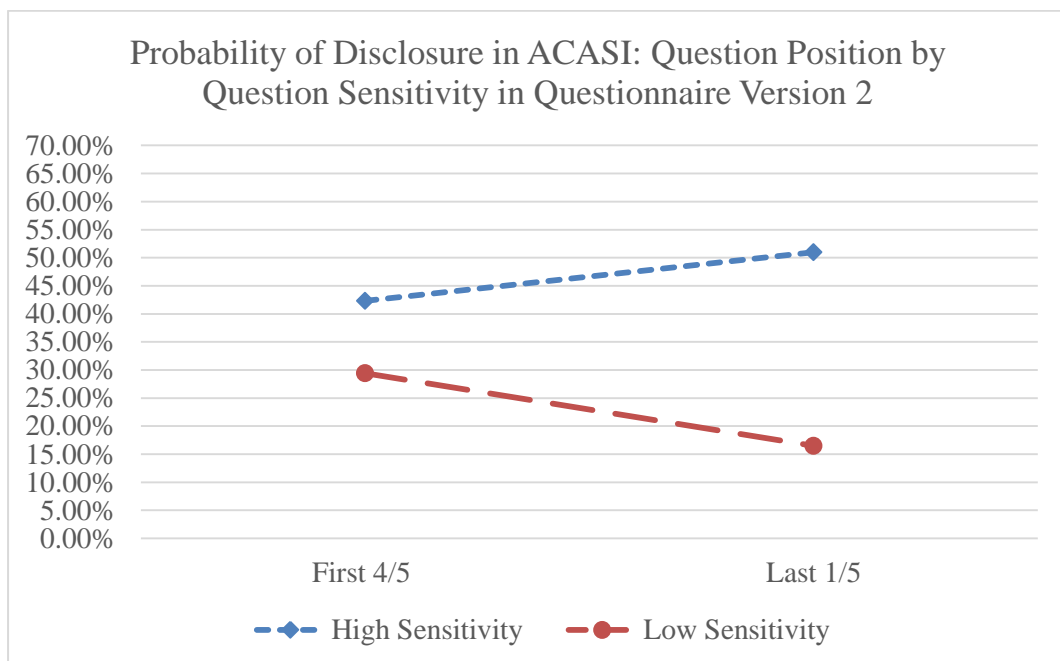
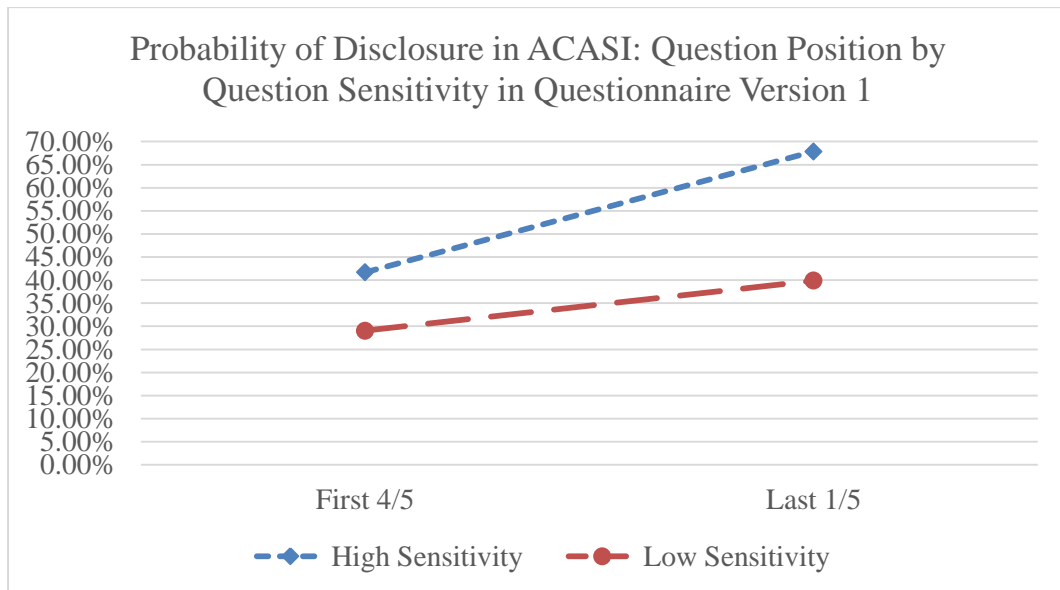
**Figure 4.** The Effects of the Vocal Similarity by Question Position by Questionnaire Version Interactions on Disclosure for the Sensitivity Test



**Figure 5.** The Effects of the Mode in Preceding Module by Rapport in Preceding Module by Question Sensitivity Interactions on Disclosure for the Sensitivity Test



**Figure 6.** The Effects of the Question Position by Question Sensitivity by Questionnaire Version Interactions on Disclosure for the Sensitivity Test



### **Michigan Employee Study of Health (MESH)**

**NOTE:** There are two versions of the questionnaire. The questions on the two versions are identical but the order of the presentation differs. Questionnaire Version 2 starts on page 48.

#### **Questionnaire Version 1**

##### **CAPI or Video-mediated Interviews**

Q1 Hello, my name is \_\_\_\_\_. We are gathering information about the health and social life of the University of Michigan employees. This project is conducted by the University of Michigan Program in Survey Methodology. All the information that you give us is voluntary and will be kept in the strictest confidence. Your name will not be attached to any of your answers without your specific permission.

CLICK [NEXT] TO CONTINUE.

Q2 First, I'm going to ask you about your health in general.  
Would you say that in general your health is...

- ☐ Excellent (1)
- ☐ Very good (2)
- ☐ Good (3)
- ☐ Fair (4)
- ☐ Poor (5)

Q3 Next I have some questions about your eating habits.  
In general, how healthy is your overall diet? Would you say...

- ☐ Excellent (1)
- ☐ Very Good (2)
- ☐ Good (3)
- ☐ Fair (4)
- ☐ Poor (5)

Q4 Next, I'm going to ask a few questions about milk products. Do not include their use in cooking. In the past 30 days, how often did you have milk to drink or on your cereal? Please include chocolate and other flavored milks as well as hot cocoa made with milk. Do not count small amounts of milk added to coffee or tea. Would you say

...

HAND R SHOWCARD 1.

- ☐ Never (1)
- ☐ Rarely--less than once a week (2)
- ☐ Sometimes--once a week or more, but less than once a day (3)
- ☐ Often--once a day or more (4)

Q5 The next question is about regular milk use. A regular milk drinker is someone who uses any type of milk at least 5 times a week. Using this definition, which statement best describes you?

HAND R SHOWCARD 2.

- ☐ I've been a regular milk drinker for most or all of my life, including my childhood (1)
- ☐ I've never been a regular milk drinker (2)
- ☐ My milk drinking has varied over my life--sometimes I've been a regular milk drinker and sometimes I have not been a regular milk drinker (3)

Q6 Next I'm going to ask you about meals. By meal, I mean breakfast, lunch and dinner. During the past 7 days, how many meals did you get that were prepared away from home in places such as restaurants, fast food places, food stands, grocery stores, or from vending machines? Please do not include meals provided as part of the community programs, for example, "Meals on Wheels", or any other programs.

--

Q7 Some grocery stores sell "ready to eat" foods such as salads, soups, chicken, sandwiches and cooked vegetables in their salad bars and deli counters. During the past 30 days, how often did you eat "ready to eat" foods from the grocery store? Please do not include sliced meat or cheese you buy for sandwiches and frozen or canned foods.

ENTER NUMBER OF TIMES	ENTER UNIT		
TIMES (1)	PER DAY (1)	WEEK (2)	MONTH (3)
<input style="width: 100px; height: 20px;" type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8 During the past 30 days, how often did you eat frozen meals or frozen pizzas? Here are some examples of frozen meals and frozen pizzas.

HAND R SHOWCARD 3.

ENTER NUMBER OF TIMES	ENTER UNIT		
TIMES (1)	PER DAY (1)	WEEK (2)	MONTH (3)
<input style="width: 100px; height: 20px;" type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 In the past 12 months, did you buy food from fast food or pizza places?

- ☐ Yes (1)
- ☐ No (2)

If Q9=2 Then Skip To Q13

Q10 The last time when you ate out or bought food at a fast-food or pizza place, did you see nutrition or health information about any foods on the menu?

- ☐ Yes (1)
- ☐ No (2)

If Q10=2 Then Skip To Q12

Q11 Did you use the information in deciding which foods to buy?

- ☐ Yes (1)
- ☐ No (2)

Q12 If nutrition or health information were readily available in fast food or pizza places, would you use it often, sometimes, rarely, or never, in deciding what to order?

- ☐ Often (1)
- ☐ Sometimes (2)
- ☐ Rarely (3)
- ☐ Never (4)

Q13 In the past 12 months, did you eat at a restaurant with waiter or waitress service?

- ☐ Yes (1)
- ☐ No (2)

If Q13=2 Then Skip To Q18

Q14 Think about the last time you ate at a restaurant with a waiter or waitress. Is it a chain-restaurant?

- ☐ Yes (1)
- ☐ No (2)

Q15 Did you see nutrition or health information about any foods on the menu?

- ☐ Yes (1)
- ☐ No (2)

If Q15=2 Then Skip To Q17

Q16 Did you use the information in deciding which foods to buy?

- ☐ Yes (1)
- ☐ No (2)

Q17 If nutrition or health information were readily available in restaurants with a waiter or waitress, would you use it often, sometimes, rarely, or never, in deciding what to order?

- ☐ Often (1)
- ☐ Sometimes (2)
- ☐ Rarely (3)
- ☐ Never (4)

Q18 The next question is about your use of dietary supplements, nonprescription antacids, and prescription medications during the past 30 days. Have you used or taken any vitamins, minerals, herbals or other dietary supplements in the past 30



days? Include prescription and non-prescription supplements. This card lists some examples of different types of dietary supplements.

#### HAND R SHOWCARD 4

- ☐ Yes (1)
- ☐ No (2)

Q19 The next questions are about sugar sweetened beverages. About how often do you drink regular soda or pop that contains sugar? Do not include diet soda or diet pop.

ENTER NUMBER OF TIMES	ENTER UNIT		
TIMES (1)	PER DAY (1)	WEEK (2)	MONTH (3)
<input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q20 About how often do you drink sweetened fruit drinks, such as Kool-aid, cranberry, and lemonade? Include fruit drinks you made at home and added sugar to.

ENTER NUMBER OF TIMES	ENTER UNIT		
TIMES (1)	PER DAY (1)	WEEK (2)	MONTH (3)
<input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q21 Have you ever been told by a doctor or other health professional that you have diabetes or sugar diabetes?

INTERVIEWER NOTE: BY “OTHER HEALTH PROFESSIONAL” WE MEAN A NURSE PRACTITIONER, A PHYSICIAN’S ASSISTANT, OR SOME OTHER LICENSED HEALTH PROFESSIONAL.

- ☐ Yes (1)
- ☐ No (2)

Q22 Have you ever been told by a doctor or other health professional that you had hypertension (hy-per-ten-shun), also called high blood pressure?

- ☐ Yes (1)
- ☐ No (2)

☐ If Q22=2 Then Skip To Q24

Q23 Are you currently taking medicine for your high blood pressure?

- ☐ Yes (1)
- ☐ No (2)

Q24 Blood cholesterol is a fatty substance found in the blood. Have you ever had your blood cholesterol checked?

- ☐ Yes (1)
- ☐ No (2)

Q25 Have you ever been told by a doctor, nurse or other professional that your blood cholesterol is high?

- ☐ Yes (1)
- ☐ No (2)

Q26 The next question is about your teeth and gums. About how long has it been since you last visited a dentist? Include all types of dentists, such as, orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists.

HAND R SHOWCARD 5.

INTERVIEWER NOTE: DENTIST: MEDICAL PERSONS WHOSE PRIMARY OCCUPATION IS CARING FOR TEETH, GUMS, AND JAWS. DENTAL CARE INCLUDES GENERAL WORK SUCH AS FILLINGS, CLEANING, EXTRACTIONS, AND ALSO SPECIALIZED WORK SUCH AS ROOT CANALS, FITTINGS FOR BRACES, ETC.

- ☐ 6 months or less (1)
- ☐ More than 6 months, but not more than 1 year ago (2)
- ☐ More than 1 year, but not more than 2 years ago (3)
- ☐ More than 2 years, but not more than 3 years ago (4)
- ☐ More than 3 years, but not more than 5 years ago (5)
- ☐ More than 5 years ago (6)
- ☐ NEVER HAVE BEEN (7)

Q27 The next questions are about exercise, recreation, or physical activities other than your regular job duties.

In a typical week, other than your regular job, do you do any vigorous-intensity sports, fitness, or recreational activities that cause large increases in breathing or heart rate like running or basketball for at least 10 minutes continuously?

INTERVIEWER NOTE: IF RESPONDENT DOES NOT HAVE A "REGULAR JOB DUTY" OR IS RETIRED, THEY MAY COUNT THEIR PHYSICAL ACTIVITY OR EXERCISE THEY SPEND THE MOST TIME DOING IN A REGULAR MONTH.

- ☐ Yes (1)
- ☐ No (2)

Q28 In a typical week, other than your regular job, do you do any moderate-intensity sports, fitness, or recreational activities that cause small increases in breathing or heart rate such as brisk walking, bicycling, swimming, or golf for at least 10 minutes continuously ?

- ☐ Yes (1)
- ☐ No (2)

Q29 Next, I would like to ask you a few questions about your sleep patterns. During the past 30 days, for about how many days have you felt you did not get enough rest or sleep?

INTERVIEWER NOTE: ENTER "0" IF RESPONDENT SAID NONE.

--

Q30 On average, how many hours of sleep do you get in a 24-hour period? Think about the time you actually spend sleeping or napping, not just the amount of sleep you think you should get.

INTERVIEWER NOTE: ENTER HOURS OF SLEEP IN WHOLE NUMBERS, ROUNDING 30 MINUTES (1/2 HOUR) OR MORE UP TO THE NEXT WHOLE HOUR AND DROPPING 29 OR FEWER MINUTES.

--

Q31 Have you ever told a doctor or other health professional that you have trouble sleeping?

- ☐ Yes (1)
- ☐ No (2)

Q32 Have you ever been told by a doctor or other health professional that you have a sleep disorder?

- ☐ Yes (1)
- ☐ No (2)

B1 Do you consider yourself now to be...

- ☐ Overweight (1)
- ☐ Underweight (2)
- ☐ About the right weight (3)

Q33 Would you like to weigh...

- ☐ More (1)
- ☐ Less (2)
- ☐ Stay about the same (3)

Q34 The next questions ask how you have been feeling during the past 30 days.

During the past 30 days, how often did you feel nervous? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q35 During the past 30 days, how often did you feel restless or fidgety? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q36 During the past 30 days, how often did you feel so sad or depressed that nothing could cheer you up? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q37 During the past 30 days, how often did you feel that everything was an effort? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q38 During the past 30 days, how often did you feel down on yourself, no good or worthless? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q39 The last questions asked about how you have been feeling during the past 30 days. Now think about the past 12 months. Was there a month in the past 12 months when you felt more depressed, anxious, or emotionally stressed than you felt during the past 30 days?

- ☐ Yes (1)
- ☐ No (2)

If Q39=2 Then Skip To Q44

Q40 Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed. During that month, how often did you feel nervous? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q41 During that same month when you were at your worst emotionally...how often did you feel restless or fidgety? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q42 During that same month when you were at your worst emotionally . . .how often did you feel so sad or depressed that nothing could cheer you up? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q43 During that same month when you were at your worst emotionally . . .how often did you feel down on yourself, no good, or worthless? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

B2 Are you now taking medicine or receiving treatment from a doctor or other health professional for any type of mental health condition or emotional problem?

- ☐ Yes (1)
- ☐ No (2)

Q44 Now I have a few questions about religion. What religion are you now, if any?

HAND R SHOWCARD 6.

- ☐ None (1)
- ☐ Catholic (2)
- ☐ Jewish (3)
- ☐ Southern Baptist (4)
- ☐ Baptist (5)
- ☐ Methodist or African Methodist (6)
- ☐ Lutheran (7)
- ☐ Presbyterian (8)
- ☐ Episcopal or Anglican (9)
- ☐ Church of Jesus Christ of Latter Day Saints (LDS/Mormon) (10)
- ☐ Other (11)

Q45 Currently, how important is religion in your daily life? Would you say it is very important, somewhat important, or not important?

- ☐ Very important (1)
- ☐ Somewhat important (2)
- ☐ Not important (3)

Q46 About how often do you attend religious services?

HAND R SHOWCARD 7.

- ☐ More than once a week (1)
- ☐ Once a week (2)
- ☐ 2 - 3 times per month (3)
- ☐ Once a month (about 12 times a year) (4)
- ☐ 3 - 11 times a year (5)
- ☐ Once or twice a year (6)
- ☐ Never (7)

Q47 The next questions ask about voting. How often would you say you vote?

- ☐ Never (1)
- ☐ Rarely (2)
- ☐ Sometimes (3)
- ☐ Often (4)

Q48 In talking to people about elections, we often find that a lot of people were not able to vote because they weren't registered, they were sick, or they just didn't have time.

Now think back to the election in 2012, which was a Presidential election. Which of the following statements best describes you:

One, I did not vote in the 2012 Presidential election;

Two, I thought about voting this time, but didn't;

Three, I usually vote, but didn't this time; or

Four, I am sure I voted?

- ☐ I did not vote in the 2012 Presidential election (1)
- ☐ I thought about voting this time, but didn't (2)
- ☐ I usually vote, but didn't this time (3)
- ☐ I am sure I voted (4)
- ☐ N/A (5)

Q49 How about the election for the House of Representatives in Washington. Did you vote for a candidate for the U.S. House of Representatives?

- ☐ Yes, voted for House of Representatives (1)
- ☐ No, didn't vote for House of Representatives (2)
- ☐ N/A (3)

Q50 Now think of the past 12 months, have you done any of the following?

	Yes (1)	No (2)
Recycled used materials such as glass, cans, paper, and clothes (1)	<input type="radio"/>	<input type="radio"/>
Bought fair trade goods or anything in a charity shop (2)	<input type="radio"/>	<input type="radio"/>
Given money or goods to other charitable causes (3)	<input type="radio"/>	<input type="radio"/>
Attended church, synagogue, or mosque almost every week (5)	<input type="radio"/>	<input type="radio"/>

Q51 How often do you use seat belts when you drive or ride a car? Would you say...

- ☐ Always (1)
- ☐ Nearly always (2)
- ☐ Sometimes (3)
- ☐ Seldom (4)
- ☐ Never (5)

Q52 Next I have a few questions about your Internet usage. Have you ever used the Internet or World Wide Web?

- ☐ Yes (1)
- ☐ No (2)

If Q52=2 Then Skip To Q54

Q53 In the past 30 days, how often have you visited a web site for?

	NEVER (1)	1-2 TIMES (2)	3-5 TIMES (3)	MORE THAN 5 TIMES (4)
News and current events (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Television or movies (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health and fitness (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B3 Sexually explicit material (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sports (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religion/church related (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q54 We are interested in how people are getting along financially these days. Would you say that you are better off or worse off financially than you were a year ago?

- ☐ Better now (1)
- ☐ Same (2)
- ☐ Worse (3)

Q55 Now looking ahead--do you think that a year from now you will be better off financially, or worse off, or just about the same as now?

- ☐ Will be better off (1)
- ☐ Same (2)
- ☐ Will be worse off (3)

Q56 Now turning to business conditions in the country as a whole--do you think that during the next 12 months we'll have good times financially, or bad times, or what?

- ☐ Good times (1)
- ☐ About the same (2)
- ☐ Bad times (3)

Q57As to the economic policy of the government--I mean steps taken to fight inflation or unemployment--would you say the government is doing a good job, only fair, or a poor job?

- ☐ Good job (1)
- ☐ Only fair (2)
- ☐ Poor job (3)



Q58 During the next 12 months, do you expect your income to be higher or lower than during the past year?

- ☐ Higher (1)
- ☐ About the same (2)
- ☐ Lower (3)

Q59 What do you think the chances are that your income will increase by more than the rate of inflation during the next five years or so?

Your answers can range from zero to one hundred, where zero means there is absolutely no chance, and one hundred means that it is absolutely certain.

INTERVIEWER NOTE: IF R ASKS FOR AN EXAMPLE OR NEEDS MORE EXPLANATIONS. FOR EXAMPLE, WHEN WEATHER FORECASTERS REPORT THE CHANCE OF RAIN, A NUMBER LIKE 20 PERCENT MEANS "A SMALL CHANCE", A NUMBER AROUND 50 PERCENT MEANS "A PRETTY EVEN CHANCE," AND A NUMBER LIKE 80 PERCENT MEANS "A VERY GOOD CHANCE."

Q60 The next questions are about encounters with the police or the court system. Not counting minor traffic violations, have you ever been arrested and booked for breaking the law?

Being 'booked' means that you were taken into custody and processed by the police or by someone connected with the courts, even if you were then released.

- ☐ Yes (1)
- ☐ No (2)

If Q60=2 Then Skip To Q63

Answer If Q63≠2

Q61 Not counting minor traffic violations, how many times during the past 12 months have you been arrested and booked for breaking a law?

Answer If Q63≠2 And Q64≥1 Or Q63≠2 And Q64 Is Empty

Q62 The next questions are about offenses that are against the law. As I read each question, please answer whether you were arrested and booked for that offense during the past 12 months.

In the past 12 months, were you arrested and booked for...

	Yes (1)	No (2)
Driving under the influence of alcohol or drugs? (1)	<input type="radio"/>	<input type="radio"/>
B4 Drunkenness or other liquor law violations? (2)	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>
Fraud, possessing stolen goods, or vandalism? (4)	<input type="radio"/>	<input type="radio"/>

Q63 The next questions are about alcoholic beverages, such as beer, wine, brandy, and mixed drinks. This card lists examples of the types of beverages we are interested in. Please review this list carefully before you answer these questions.

HAND R SHOWCARD 8.

By a "drink," we mean a can or bottle of beer, a glass of wine or a wine cooler, a shot of liquor, or a mixed drink with liquor in it.

Have you ever, even once, had a drink of any type of alcoholic beverage? Please do not include times when you only had a sip or two from a drink.

☐ Yes (1)

☐ No (2)

If Q63=2 Then Skip To Q69

Answer If Q66=1

Q64 Think about the first time you had a drink of an alcoholic beverage. How old were you the first time you had a drink of an alcoholic beverage? Please do not include any time when you only had a sip or two from a drink.

Answer If Q66=1

Q65 How long has it been since you last drank an alcoholic beverage?

☐ Within the past 30 days (1)

☐ More than 30 days ago but within the past 12 months (2)

☐ More than 12 months ago (3)

If Q65=2 Then Skip To Q68

If Q65=3 Then Skip To Q68

Answer If Q65=1

B5 Think specifically about the past 30 days. During the past 30 days, on how many days did you drink one or more drinks of an alcoholic beverage?

Answer If **MALE** And Q65=1

Q66M During the past 30 days, on how many days did you have 5 or more drinks on the same occasion? By "occasion", we mean at the same time or within a couple of hours of each other.

Answer If **FEMALE** And Q65=1

Q66F During the past 30 days, on how many days did you have 4 or more drinks on the same occasion? By "occasion", we mean at the same time or within a couple of hours of each other.

Answer If Q65=1

Q67 During the past 30 days, what is the largest number of drinks you had on any occasion?

Answer If MALE

Q68M Was there ever a time or times in your life when you drank 5 or more drinks of any kind of alcoholic beverage almost every day?

- ☐ Yes (1)
- ☐ No (2)

Answer If FEMALE

Q68F Was there ever a time or times in your life when you drank 4 or more drinks of any kind of alcoholic beverage almost every day?

- ☐ Yes (1)
- ☐ No (2)

Q69 These next questions are about your use of tobacco products. This includes cigarettes, chewing tobacco, snuff, cigars, and pipe tobacco. The first questions are about cigarettes only. Have you ever smoked part or all of a cigarette?

- ☐ Yes (1)
- ☐ No (2)

If Q69=2 To Q71

Answer Q69=1

Q70 Now think about the past 30 days. During the past 30 days, have you smoked part or all of a cigarette?

- ☐ Yes (1)
- ☐ No (2)

Q71 The next questions are about your use of snuff, sometimes called dip. Snuff is a finely ground form of tobacco that usually comes in a container called a tin. You can use snuff by placing a pinch or dip in your mouth between your lip and gum or between your cheek and gum. Snuff can also be inhaled through the nose. Snuff is sold in both loose form and in ready-to-use packets.

Have you ever used snuff, even once?

- ☐ Yes (1)
- ☐ No (2)

If Q71=2 Then Skip To Q73

Answer If Q71=1

Q72 Now think about the past 30 days. During the past 30 days, have you used snuff, even once?

- ☐ Yes (1)
- ☐ No (2)

Q73 The next questions are only about chewing tobacco. Chewing tobacco is coarsely shredded tobacco that is sold in pouches of loose tobacco leaves or in a “plug” or “twist” form. To use chewing tobacco, you either chew it or hold it in your cheek or inside your lower lip.

Have you ever used chewing tobacco, even once?

☐ Yes (1)

☐ No (2)

If Q73=2 Then Skip To Q75

Answer If Q73=1

Q74 Now think about the past 30 days. During the past 30 days, have you used chewing tobacco, even once?

☐ Yes (1)

☐ No (2)

Q75 The next questions are about smoking cigars. By cigars we mean any kind, including big cigars, cigarillos, and even little cigars that look like cigarettes. Have you ever smoked part or all of a cigar?

☐ Yes (1)

☐ No (2)

If Q75=2 Then Skip To Q77

Answer If Q75=1

Q76 Now think about the past 30 days. During the past 30 days, have you smoked part or all of any type of cigar?

☐ Yes (1)

☐ No (2)

Q77 The next question is about marijuana and hashish. Marijuana is also called pot or grass. Marijuana is usually smoked, either in cigarettes, called joints, or in a pipe. It is sometimes cooked in food. Hashish is a form of marijuana that is also called “hash.” It is usually smoked in a pipe. Another form of hashish is hash oil. Have you ever, even once, used marijuana or hashish?

☐ Yes (1)

☐ No (2)

If Q77=2 Then Skip To Q79

Q79 Sometimes people take tobacco out of a cigar and replace it with marijuana. This is sometimes called a ‘blunt’. Have you ever smoked part or all of a cigar with marijuana in it?

☐ Yes (1)

☐ No (2)

Answer If Q78=1

B6 On how many of the past 30 days, did you smoke part or all of a cigar with marijuana in it?

Q80 The next question is about the use of pain relievers. We are not interested in your use of "over-the-counter" drugs that can be bought in drug stores or grocery stores without a doctor's prescription. We are interested in your use of any form of prescription pain relievers that were not prescribed for you or that you took only for the experience or feeling they caused.

HAND R SHOWCARD 9.

This card lists the names of some different kinds of prescription pain relievers. Please review this card carefully before you answer the question.

Have you ever, even once, used any pain relievers that was not prescribed for you or that you took only for the experience or feeling it caused?

☐ Yes (1)

☐ No (2)

If Q80=2 Then Skip To B7/Q81

B7 The next question asks about the use of tranquilizers. Tranquilizers are usually prescribed to relax people, to calm people down, to relieve anxiety, or to relax muscle spasms. Some people call tranquilizers 'nerve pills.' We are interested in your use of any prescription tranquilizers that were not prescribed for you or that you took only for the experience or feeling they caused.

HAND R SHOWCARD 10.

This card lists the names of some different kinds of prescription tranquilizers. Please review this card carefully before you answer the question. Have you ever, even once, used any tranquilizers that were not prescribed for you or that you took only for the experience or feeling it caused?

☐ Yes (1)

☐ No (2)

If Q91=2 Then Skip To Q93

If MALE Answer Q81M to Q87M

Q81M The next questions are about sexual experiences that you may have had with a female.

Here are some things you may have done with a female. If you have ever done this at least one time with a female, answer yes. If you have never done this, answer no.

Have you ever had sexual intercourse with a female (sometimes this is called making love, having sex, or going all the way)?

☐ Yes (1)

☐ No (2)

Q82M Have you ever put your penis in a female's vagina (also known as vaginal intercourse)?

- ☐ Yes (1)
- ☐ No (2)

Q83M Was a condom used the last time you had vaginal intercourse with a female?

- ☐ Yes (1)
- ☐ No (2)

Q84M The last time you had vaginal intercourse with a female, did you use the condom to...

- ☐ To prevent pregnancy (1)
- ☐ To prevent diseases like syphilis, gonorrhea or AIDS (2)
- ☐ For both reasons (3)
- ☐ Or for some other reason (4)

Q85M Think back to the very first time you had vaginal intercourse with a female. Would you say then that this first vaginal intercourse was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?

- ☐ Voluntary (1)
- ☐ Not voluntary (2)

Q86M Were any of these kinds of force used? Were you given alcohol or drugs?

- ☐ Yes (1)
- ☐ No (2)

B8M Were you physically hurt or injured?

- ☐ Yes (1)
- ☐ No (2)

B9M Were you physically held down?

- ☐ Yes (1)
- ☐ No (2)

B10M Thinking about the last 12 months, how many female sex partners have you had in the 12 months? Please count every partner, even those you had sex with only once in those 12 months.

--

B11M The next questions ask about sexual experiences you may have had with another male. Has another male ever performed oral sex on you, that is, stimulated your penis with his mouth?

- ☐ Yes (1)
- ☐ No (2)

Q87M Have you ever had any sexual experience of any kind with another male?

- ☐ Yes (1)
- ☐ No (2)

#### If FEMALE Answer Q81F to Q87F

Q81F The next questions are about sexual experiences that you may have had with a male.

Here are some things you may have done with a male. If you have ever done this at least one time with a male, answer yes. If you have never done this, answer no.

At any time in your life, have you ever had sexual intercourse with a man, that is, made love, had sex, or gone all the way?

- ☐ Yes (1)
- ☐ No (2)

Q82F Has a male ever put his penis in your vagina (also known as vaginal intercourse)?

- ☐ Yes (1)
- ☐ No (2)

Q83F Was a condom used the last time you had vaginal intercourse with a male?

- ☐ Yes (1)
- ☐ No (2)

Q84F The last time you had vaginal intercourse with a male, did you use the condom to...

- ☐ To prevent pregnancy (1)
- ☐ To prevent diseases like syphilis, gonorrhea or AIDS (2)
- ☐ For both reasons (3)
- ☐ Or for some other reason (4)

Q85F Think back to the very first time you had vaginal intercourse with a male.

Would you say then that this first vaginal intercourse was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?

- ☐ Voluntary (1)
- ☐ Not voluntary (2)

Q86F Were any of these kinds of force used? Were you given alcohol or drugs?

- ☐ Yes (1)
- ☐ No (2)

B8F Were you physically hurt or injured?

- ☐ Yes (1)
- ☐ No (2)

B9F Were you physically held down?

- ☐ Yes (1)
- ☐ No (2)

B10F Thinking about the last 12 months, how many male sex partners have you had in the 12 months? Please count every partner, even those you had sex with only once in those 12 months.

--

B11F The next questions ask about sexual experiences you may had with another female. Has another female ever performed oral sex on you?

- ☐ Yes (1)
- ☐ No (2)

Q87F Have you ever had any sexual experience of any kind with another female?

- ☐ Yes (1)
- ☐ No (2)

Q88 Income is important in analyzing the information we collect. For example, this information helps us to learn whether people in different income groups have different dietary behaviors. Next, I need to know your total earnings before taxes. Will it be easier for you to tell me your total weekly, monthly, or yearly earnings?

- ☐ Weekly (1)
- ☐ Monthly (2)
- ☐ Yearly (3)



Answer If Q88=1

Q89 Which category represents your total weekly earnings before taxes?

HAND R SHOWCARD 11

- ☐ UNDER \$96 (1)
- ☐ \$ 96-143 (2)
- ☐ \$ 144-191 (3)
- ☐ \$ 192-239 (4)
- ☐ \$ 240-288 (5)
- ☐ \$ 289-384 (6)
- ☐ \$ 385-480 (7)
- ☐ \$ 481-576 (8)
- ☐ \$ 577-672 (9)
- ☐ \$ 673-768 (10)
- ☐ \$ 769-961 (11)
- ☐ \$ 962-1,153 (12)
- ☐ \$1,154-1,441 (13)
- ☐ \$1,442 or more (14)

Answer If Q88=2

Q90 Which category represents your total monthly earnings before taxes?

HAND R SHOWCARD 12

- ☐ UNDER \$417 (1)
- ☐ \$ 417-624 (2)
- ☐ \$ 625-832 (3)
- ☐ \$ 833-1041 (4)
- ☐ \$1,042-1,249 (5)
- ☐ \$1,250-1,666 (6)
- ☐ \$1,667-2,082 (7)
- ☐ \$2,083-2,499 (8)
- ☐ \$2,500-2,916 (9)
- ☐ \$2,917-3,332 (10)
- ☐ \$3,333-4,166 (11)
- ☐ \$4,167-4,999 (12)
- ☐ \$5,000-6,249 (13)
- ☐ \$6,250 or more (14)

Answer If Q88=3

Q91 Which category represents your total yearly earnings before taxes?

HAND R SHOWCARD 13

- ☐ UNDER \$5,000 (1)
- ☐ \$ 5,000-7,499 (2)
- ☐ \$ 7,500-9,999 (3)
- ☐ \$10,000-12,499 (4)
- ☐ \$12,500-14,999 (5)
- ☐ \$15,000-19,999 (6)
- ☐ \$20,000-24,999 (7)
- ☐ \$25,000-29,999 (8)
- ☐ \$30,000-34,999 (9)
- ☐ \$35,000-39,999 (10)
- ☐ \$40,000-49,999 (11)
- ☐ \$50,000-59,999 (12)
- ☐ \$60,000-74,999 (13)
- ☐ \$75,000 or more (14)

Answer If Q88 Is Empty Or Q89 Is Empty Or Q90 Is Empty Or Q91 Is Empty

Q92 Was it \$20,000 or more per year?

- ☐ Yes (1)
- ☐ No (2)

Answer If Q92=1

Q93 Was it \$50,000 or more per year?

- ☐ Yes (1)
- ☐ No (2)

Answer If Q93=1

Q94 Was it \$75,000 or more per year?

- ☐ Yes (1)
- ☐ No (2)

Q95 Next I have some questions about your demographic information. What is your age?

Q96 What is the highest grade or level of school you have completed or the highest degree you have received?

HAND R SHOWCARD 14.

INTERVIEWER NOTE: ENTER HIGHEST LEVEL OF SCHOOL.

- ☐ Never attended/Kindergarten only (1)
- ☐ 1st Grade (2)
- ☐ 2nd Grade (3)
- ☐ 3rd Grade (4)
- ☐ 4th Grade (5)
- ☐ 5th Grade (6)
- ☐ 6th Grade (7)
- ☐ 7th Grade (8)
- ☐ 8th Grade (9)
- ☐ 9th Grade (10)
- ☐ 10th Grade (11)
- ☐ 11th Grade (12)
- ☐ 12th Grade, no diploma (13)
- ☐ High school graduate (14)
- ☐ GED or equivalent (15)
- ☐ Some college, no degree (16)
- ☐ Associated degree: Occupational, technical, or vocational program (17)
- ☐ Associated degree: Academic program (18)
- ☐ Bachelor's degree (example: BA, AB, BS, BBA) (19)
- ☐ Master's degree (example: MA, MS, MEng, MEd, MBA) (20)
- ☐ Professional school degree (example: MD, DDS, DVM, JD) (21)
- ☐ Doctoral degree (example: PhD, EdD) (22)

Q97M Are you Hispanic or Latino, or of Spanish origin?

- ☐ Yes (1)
- ☐ No (2)

Q97F Are you Hispanic or Latina, or of Spanish origin?

- ☐ Yes (1)
- ☐ No (2)

Q98 Which one of the following groups would you say best describes your racial background?

HAND R SHOWCARD 15.

- ☐ White (1)
- ☐ Black or African American (2)
- ☐ Asian (3)
- ☐ Native Hawaiian or Other Pacific Islander (4)
- ☐ American Indian or Alaska Native (5)
- ☐ MIXED OR OTHER (IF VOLUNTEERED)

Q99 What is your current marital status? Are you...

HAND R SHOWCARD 16.

- ☐ Married (1)
- ☐ Not married but living together with a partner (2)
- ☐ Widowed (3)
- ☐ Divorced (4)
- ☐ Separated (5)
- ☐ Never been married (6)

Q100 About how tall are you without shoes?

INTERVIEWER NOTE: ENTER HEIGHT IN WHOLE NUMBERS, ROUNDING 0.5 OR MORE UP TO THE NEXT WHOLE NUMBER AND DROPPING 0.4 OR FEWER.

Q188 About how tall are you without shoes?

INTERVIEWER NOTE: CHECK ALL UNITS THAT APPLY AND THEN ENTER THE QUANTITY)

- ☐ FEET (1) \_\_\_\_\_
- ☐ INCHES (2) \_\_\_\_\_
- ☐ METERS (3) \_\_\_\_\_
- ☐ CENTIMETERS (4) \_\_\_\_\_

### **ACASI (Audio Computer-Assisted Self-Interviewing)**

**INTRO1** Welcome to the self-interviewing system, which lets you control the interview and answer in complete privacy. First, you will learn how to use the system and complete some practice questions. You will learn how to enter answers and how to back up if you make a mistake and want to change an answer.

Click [NEXT] to move to the next screen.

**INTRO2** In this system you can read the questions on the computer screen and hear them read through the headphones. During the reading of the question, the [NEXT] button will be disabled. Once the reading is over, the [NEXT] button will be enabled. Please put on your headphones and click [NEXT] to continue.

**PRAC1** To answer a question, you first move the mouse to the circle that is shown next to your answer and then left click the mouse to select it.

In what month were you born?

- ☐ January
- ☐ February
- ☐ March
- ☐ April
- ☐ May
- ☐ June
- ☐ July
- ☐ August
- ☐ September
- ☐ October
- ☐ November
- ☐ December

**PRAC2** Other questions will ask you to type in a number instead of choosing a number from a list.

In what year were you born? Please enter the 4-digit year you were born in the text box below and click [NEXT].

**INTRO3** If you want to change or see your answer to a previous question, you can click the [BACK] button. Each time you click [BACK], the computer will go back one question. Click [NEXT] to continue.

**INTRO4** If you do not know the answer to a question or do not wish to answer a particular question, click [NEXT] to skip to the next question. Please click [NEXT] to continue.

**PRAC3** For some of the questions, the computer can only accept certain answers. For example, in the question below, the numbers the computer will accept are from 50 to 995. If you try to enter numbers not between 50 to 995, an instruction box will appear on top of the screen in red when you click [NEXT]. To correct your answer, enter a number within the range 50 to 995. Try this with the question below. Type 45 as your answer.

How much do you weigh? Please answer in pounds and then click [NEXT]

**INTRO5** Sometimes a reminder box will appear on the screen if you click [NEXT] without answering the question. On the reminder box, you can click [Answer the Question] to provide an answer. Or you can click [Continue without Answering] to skip to the next question.  
Click [NEXT] to continue.

**INTRO6** If you have any questions about how to use the computer, please ask your interviewer now. Otherwise, please click [NEXT] to continue on your own.

**INTRO7** The next questions are about alcoholic beverages, such as beer, wine, brandy, and mixed drinks. Listed on the next screen are examples of the types of beverages we are interested in. Please review this list carefully before you answer these questions.

Click [NEXT] to continue.

**INTRO8** Please review this list carefully before you click [NEXT] to continue.

**INTRO9** These questions are about drinks of alcoholic beverages. Throughout these questions, by a “drink,” we mean a can or bottle of beer, a glass of wine or a wine cooler, a shot of liquor, or a mixed drink with liquor in it. We are not asking about times when you only had a sip or two from a drink.

Click [NEXT] to continue.

**Q1** Now think about the past 12 months. We want to know how many days you’ve had a drink of an alcoholic beverage during the past 12 months.

What would be the easiest way for you to tell us how many days you drank alcoholic beverages?

- ☐ Average number of days per week during the past 12 months
- ☐ Average number of days per month during the past 12 months
- ☐ Total number of days during the past 12 months

**Q2** On how many days in the past 12 months did you drink an alcoholic beverage?

**Q3** On average, how many days did you drink an alcoholic beverage each month during the past 12 months?

**Q4** On average, how many days did you drink an alcoholic beverage each week during the past 12 months?

**Q6** On the days that you drank during the past 30 days, how many drinks did you usually have each day? Count as a drink a can or bottle of beer; a wine cooler or a glass of wine, champagne, a sherry; a shot of liquor or a mixed drink or cocktail.

If you didn't drink any alcoholic beverages during the past 30 days, enter 0.

**Q7** During the past 12 months, have you driven a vehicle while you were under the influence of alcohol?

- ☐ Yes
- ☐ No

**INTRO10** The next questions are about marijuana and hashish. Marijuana is also called pot or grass. Marijuana is usually smoked, either in cigarettes, called joints, or in a pipe. It is sometimes cooked in food. Hashish is a form of marijuana that is also called “hash.” It is usually smoked in a pipe. Another form of hashish is hash oil. Click [NEXT] to continue.

**Q8** How long has it been since you last used marijuana or hashish?

- ☐ Within the past 30 days
- ☐ More than 30 days ago but within the past 12 months
- ☐ More than 12 months ago
- ☐ Never used marijuana or hashish

**Q9** Now think about the past 12 months. We want to know how many days you’ve used marijuana or hashish during the past 12 months.

What would be the easiest way for you to tell us how many days you have used it?

- ☐ Average number of days per week during the past 12 months
- ☐ Average number of days per month during the past 12 months
- ☐ Total number of days during the past 12 months

**Q10** On how many days in the past 12 months did you use marijuana or hashish?

**Q11** On average, how many days did you use marijuana or hashish each month during the past 12 months?

**Q12** On average, how many days did you use marijuana or hashish each week during the past 12 months?

**Q13** Sometimes people take tobacco out of a cigar and replace it with marijuana. This is sometimes called a ‘blunt’.

How long has it been since you last smoked part or all of a cigar with marijuana in it?

- ☐ Within the past 30 days
- ☐ More than 30 days ago but within the past 12 months
- ☐ More than 12 months ago
- ☐ Never smoked part or all of a cigar with marijuana in it

**INTRO11** The next question is about the use of pain relievers. We are not interested in your use of “over-the-counter” drugs that can be bought in drug stores or grocery stores without a doctor’s prescription. We are interested in your use of any form of prescription pain relievers that were not prescribed for you or that you took only for the experience or feeling they caused. Click [NEXT] to continue.

**INTRO12** Here lists the names of some different kinds of prescription pain relievers. Please review this list carefully before you click [NEXT] to continue.

**Q15** On how many days in the past 12 months did you use any prescription pain reliever that was not prescribed for you or that you took only for the experience or feeling it caused?

**INTRO13** The next questions ask about the use of tranquilizers. Tranquilizers are usually prescribed to relax people, to calm people down, to relieve anxiety, or to relax muscle spasms. Some people call tranquilizers ‘nerve pills.’ We are interested in your use of any prescription tranquilizers that were not prescribed for you, or that you took only for the experience or feeling they caused.  
Click [NEXT] to continue.

**INTRO14** Here lists the names of some different kinds of prescription tranquilizers. Please review this list carefully before you click [NEXT] to continue.

**Q17** How long has it been since you last used any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?

- ☐ Within the past 30 days
- ☐ More than 30 days ago but within the past 12 months
- ☐ More than 12 months ago
- ☐ Never used prescription tranquilizer that was not prescribed for me

**Q18** Now think about the past 12 months. We want to know how many days you have used any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused during the past 12 months.

What would be the easiest way for you to tell us how many days you used a prescription tranquilizer in either of these ways?

- ☐ Average number of days per week during the past 12 months
- ☐ Average number of days per month during the past 12 months
- ☐ Total number of days during the past 12 months

**Q19** On how many days in the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?

**Q20** On average, how many days each month during the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?

**Q21** On average, how many days each week during the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?

**INTRO15M** The next questions are about sexual experiences that you may have had with a female. Here are some things you may have done with a female. If you



have ever done this at least one time with a female, answer yes. If you have never done this, answer no.  
Please click [NEXT] to continue.

**Q22M** Have you ever put your penis in a female's vagina (also known as vaginal intercourse)?

- ☐ Yes
- ☐ No

**Q23M** The first time this occurred, how old were you?

**Q24M** The first time this occurred, how old was she?

**Q25M** The next question is about oral sex. By oral sex, we mean stimulating the genitals with the mouth. Did you use a condom the last time a female performed oral sex on you?

- ☐ Yes
- ☐ No
- ☐ Never had oral sex

**Q26M** Have you ever put your penis in a female's rectum or butt (also known as anal sex)?

- ☐ Yes
- ☐ No

**Q27M** As you know, some people have had sexual intercourse by your age and others have not. What would you say is the most important reason why you have not had sexual intercourse up to now?

- ☐ Against religion or morals
- ☐ Don't want to get a female pregnant
- ☐ Don't want to get a sexually transmitted disease
- ☐ Haven't found the right person yet
- ☐ In a relationship, but waiting for the right time
- ☐ Other

**Q28M** The very last time you had any type of sex -- that is, vaginal intercourse or anal sex or oral sex -- with a female partner, did you use a condom?

- ☐ Yes
- ☐ No

**Q29M** Think back to the very first time you had vaginal intercourse with a female. Would you say then that this first vaginal intercourse was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?

- ☐ Voluntary
- ☐ Not voluntary

**Q30M** Were any of these kinds of force used?

Did you do what she said because she was bigger than you or a grown-up, and you were young?

- ☐ Yes
- ☐ No

**Q31M** Were you threatened with physical hurt or injury?

- ☐ Yes
- ☐ No

**Q34M** Besides the time you already reported, have you ever been forced by a female to have vaginal intercourse against your will?

- ☐ Yes
- ☐ No

**Q35M** How many different females have you ever had intercourse with? This includes any female you had intercourse with, even if it was only once or if you did not know her well.

- ☐ One
- ☐ Two
- ☐ Three
- ☐ Four
- ☐ Five
- ☐ Six
- ☐ 7 or more

**Q37M** In the last 12 months, did you have sex with any females who were also having sex with other people at around the same time?

- ☐ Yes
- ☐ No

**Q38M** The next questions ask about sexual experiences you may have had with another male. Have you ever performed oral sex on another male, that is, stimulated his penis with your mouth?

- ☐ Yes
- ☐ No

**INTRO15F** The next questions are about sexual experiences that you may have had with a male. Here are some things you may have done with a male. If you have ever done this at least one time with a male, answer yes. If you have never done this, answer no.  
Please click [NEXT] to continue.

**Q22F** Has a male ever put his penis in your vagina (also known as vaginal intercourse)?

- ☐ Yes
- ☐ No

**Q23F** The first time this occurred, how old were you?

**Q24F** The first time this occurred, how old was he?

**Q25F** The next question is about oral sex. By oral sex, we mean stimulating the genitals with the mouth. Was a condom used the last time you performed oral sex on a male?

- ☐ Yes
- ☐ No
- ☐ Never had oral sex

**Q26F** Has a male ever put his penis in your rectum or butt (also known as anal sex)?

- ☐ Yes
- ☐ No

**Q27F** As you know, some people have had sexual intercourse by your age and others have not. What would you say is the most important reason why you have not had sexual intercourse up to now?

- ☐ Against religion or morals
- ☐ Don't want to get pregnant
- ☐ Don't want to get a sexually transmitted disease
- ☐ Haven't found the right person yet
- ☐ In a relationship, but waiting for the right time
- ☐ Other

**Q28F** The very last time you had any type of sex -- that is, vaginal intercourse or anal sex or oral sex -- with a male partner, was a condom used?

- ☐ Yes
- ☐ No

**Q29F** Think back to the very first time you had vaginal intercourse with a male. Would you say then that this first vaginal intercourse was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?

- ☐ Voluntary
- ☐ Not voluntary

**Q30F** Were any of these kinds of force used? Did you do what he said because he was bigger than you or a grown-up, and you were young?

- ☐ Yes
- ☐ No

**Q31F** Were you threatened with physical hurt or injury?

- ☐ Yes
- ☐ No

**Q34F** Besides the time you already reported, have you ever been forced by a male to have vaginal intercourse against your will?

- ☐ Yes
- ☐ No

**Q35F** Counting all your male sexual partners, even those you had intercourse with only once, how many men have you had sexual intercourse with in your life?

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**Q37F** In the last 12 months, did you have sex with any males who were also having sex with other people at around the same time?

- ☐ Yes
- ☐ No

**Q38F** The next questions ask about sexual experiences you may have had with another female. Have you ever performed oral sex on another female?

- ☐ Yes
- ☐ No

**Q40** When, if ever, was the last occasion you masturbated? That is, aroused yourself sexually?

- ☐ In the past 7 days
- ☐ Between 7 days and 4 weeks ago
- ☐ Between 4 weeks and 6 months ago
- ☐ Between 6 months and 1 year ago
- ☐ Between 1 year and 5 years ago
- ☐ Longer than 5 years ago
- ☐ Never masturbated or aroused myself sexually

**Q42** The next question asks how you have been feeling during the past 30 days. During the past 30 days, how often did you feel hopeless? Would you say...

- ☐ All of the time
- ☐ Most of the time
- ☐ Some of the time
- ☐ A little of the time
- ☐ None of the time

**Q43** Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed...how often did you feel hopeless? Would you say...

- ☐ All of the time
- ☐ Most of the time
- ☐ Some of the time
- ☐ A little of the time
- ☐ None of the time

**Q44** During that same month when you were at your worst emotionally...how often did you feel that everything was an effort? Would you say...

- ☐ All of the time
- ☐ Most of the time
- ☐ Some of the time
- ☐ A little of the time
- ☐ None of the time

**Q46M** About how much do you weigh without shoes?

Please enter the quantity at first and then select the appropriate unit.

ENTER QUANTITY	ENTER UNIT	
QUANTITY (1) <input type="text"/>	POUNDS (1) <input type="radio"/>	KILOGRAMS (2) <input type="radio"/>

**Q46F** About how much do you weigh without shoes? If you are currently pregnant, provide your weight before pregnancy.

Please enter the quantity at first and then select the appropriate unit.

ENTER QUANTITY	ENTER UNIT	
QUANTITY (1) <input type="text"/>	POUNDS (1) <input type="radio"/>	KILOGRAMS (2) <input type="radio"/>

**Q47** Now think of the past 12 months, have you given money or goods to the homeless?

- ☐ Yes
- ☐ No

## **Questionnaire Version 2**

### **CAPI or Video-mediated Interviews**

Q1 Hello, my name is \_\_\_\_\_. We are gathering information about the health and social life of the University of Michigan employees. This project is conducted by the University of Michigan Program in Survey Methodology. All the information that you give us is voluntary and will be kept in the strictest confidence. Your name will not be attached to any of your answers without your specific permission.  
CLICK [NEXT] TO CONTINUE.

Q2 First, I'm going to ask you about your health in general.  
Would you say that in general your health is...

- ☐ Excellent (1)
- ☐ Very good (2)
- ☐ Good (3)
- ☐ Fair (4)
- ☐ Poor (5)

Q3 Next I have some questions about your eating habits.  
In general, how healthy is your overall diet? Would you say...

- ☐ Excellent (1)
- ☐ Very Good (2)
- ☐ Good (3)
- ☐ Fair (4)
- ☐ Poor (5)

Q4 Next, I'm going to ask a few questions about milk products. Do not include their use in cooking. In the past 30 days, how often did you have milk to drink or on your

cereal? Please include chocolate and other flavored milks as well as hot cocoa made with milk. Do not count small amounts of milk added to coffee or tea. Would you say

...

HAND R SHOWCARD 1.

- ☐ Never (1)
- ☐ Rarely--less than once a week (2)
- ☐ Sometimes--once a week or more, but less than once a day (3)
- ☐ Often--once a day or more (4)

Q5 The next question is about regular milk use. A regular milk drinker is someone who uses any type of milk at least 5 times a week. Using this definition, which statement best describes you?

HAND R SHOWCARD 2.

- ☐ I've been a regular milk drinker for most or all of my life, including my childhood (1)
- ☐ I've never been a regular milk drinker (2)
- ☐ My milk drinking has varied over my life--sometimes I've been a regular milk drinker and sometimes I have not been a regular milk drinker (3)

Q6 Next I'm going to ask you about meals. By meal, I mean breakfast, lunch and dinner. During the past 7 days, how many meals did you get that were prepared away from home in places such as restaurants, fast food places, food stands, grocery stores, or from vending machines? Please do not include meals provided as part of the community programs, for example, "Meals on Wheels", or any other programs.

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Q7 Some grocery stores sell "ready to eat" foods such as salads, soups, chicken, sandwiches and cooked vegetables in their salad bars and deli counters. During the past 30 days, how often did you eat "ready to eat" foods from the grocery store? Please do not include sliced meat or cheese you buy for sandwiches and frozen or canned foods.

ENTER NUMBER OF TIMES	ENTER UNIT		
TIMES (1)	PER DAY (1)	WEEK (2)	MONTH (3)
<input style="width: 100px; height: 20px;" type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8 During the past 30 days, how often did you eat frozen meals or frozen pizzas? Here are some examples of frozen meals and frozen pizzas.

HAND R SHOWCARD 3.

ENTER NUMBER OF TIMES	ENTER UNIT		
TIMES (1)	PER DAY (1)	WEEK (2)	MONTH (3)
<input style="width: 100px; height: 20px;" type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 In the past 12 months, did you buy food from fast food or pizza places?

- ☐ Yes (1)
- ☐ No (2)

If Q9=2 Then Skip To Q13

Q10 The last time when you ate out or bought food at a fast-food or pizza place, did you see nutrition or health information about any foods on the menu?

- ☐ Yes (1)
- ☐ No (2)

If Q10=2 Then Skip To Q12

Q11 Did you use the information in deciding which foods to buy?

- ☐ Yes (1)
- ☐ No (2)

Q12 If nutrition or health information were readily available in fast food or pizza places, would you use it often, sometimes, rarely, or never, in deciding what to order?

- ☐ Often (1)
- ☐ Sometimes (2)
- ☐ Rarely (3)
- ☐ Never (4)

Q13 In the past 12 months, did you eat at a restaurant with waiter or waitress service?

- ☐ Yes (1)
- ☐ No (2)

If Q13=2 Then Skip To Q18

Q14 Think about the last time you ate at a restaurant with a waiter or waitress. Is it a chain-restaurant?

- ☐ Yes (1)
- ☐ No (2)

Q15 Did you see nutrition or health information about any foods on the menu?

- ☐ Yes (1)
- ☐ No (2)

If Q15=2 Then Skip To Q17

Q16 Did you use the information in deciding which foods to buy?

- ☐ Yes (1)
- ☐ No (2)



Q17 If nutrition or health information were readily available in restaurants with a waiter or waitress, would you use it often, sometimes, rarely, or never, in deciding what to order?

- ☐ Often (1)
- ☐ Sometimes (2)
- ☐ Rarely (3)
- ☐ Never (4)

Q18 The next question is about your use of dietary supplements, nonprescription antacids, and prescription medications during the past 30 days. Have you used or taken any vitamins, minerals, herbals or other dietary supplements in the past 30 days? Include prescription and non-prescription supplements. This card lists some examples of different types of dietary supplements.

HAND R SHOWCARD 4

- ☐ Yes (1)
- ☐ No (2)

Q19 The next questions are about sugar sweetened beverages. About how often do you drink regular soda or pop that contains sugar? Do not include diet soda or diet pop.

ENTER NUMBER OF TIMES	ENTER UNIT		
TIMES (1) <input type="text"/>	PER DAY (1) <input type="radio"/>	WEEK (2) <input type="radio"/>	MONTH (3) <input type="radio"/>

Q20 About how often do you drink sweetened fruit drinks, such as Kool-aid, cranberry, and lemonade? Include fruit drinks you made at home and added sugar to.

ENTER NUMBER OF TIMES	ENTER UNIT		
TIMES (1) <input type="text"/>	PER DAY (1) <input type="radio"/>	WEEK (2) <input type="radio"/>	MONTH (3) <input type="radio"/>

Q21 Have you ever been told by a doctor or other health professional that you have diabetes or sugar diabetes?

INTERVIEWER NOTE: BY “OTHER HEALTH PROFESSIONAL” WE MEAN A NURSE PRACTITIONER, A PHYSICIAN’S ASSISTANT, OR SOME OTHER LICENSED HEALTH PROFESSIONAL.

- ☐ Yes (1)
- ☐ No (2)

Q22 Have you ever been told by a doctor or other health professional that you had hypertension (hy-per-ten-shun), also called high blood pressure?

☐ Yes (1)

☐ No (2)

☐ If Q22=2 Then Skip To Q24

Q23 Are you currently taking medicine for your high blood pressure?

☐ Yes (1)

☐ No (2)

Q24 Blood cholesterol is a fatty substance found in the blood. Have you ever had your blood cholesterol checked?

☐ Yes (1)

☐ No (2)

Q25 Have you ever been told by a doctor, nurse or other professional that your blood cholesterol is high?

☐ Yes (1)

☐ No (2)

Q26 The next question is about your teeth and gums. About how long has it been since you last visited a dentist? Include all types of dentists, such as, orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists.

HAND R SHOWCARD 5.

INTERVIEWER NOTE: DENTIST: MEDICAL PERSONS WHOSE PRIMARY OCCUPATION IS CARING FOR TEETH, GUMS, AND JAWS. DENTAL CARE INCLUDES GENERAL WORK SUCH AS FILLINGS, CLEANING, EXTRACTIONS, AND ALSO SPECIALIZED WORK SUCH AS ROOT CANALS, FITTINGS FOR BRACES, ETC.

☐ 6 months or less (1)

☐ More than 6 months, but not more than 1 year ago (2)

☐ More than 1 year, but not more than 2 years ago (3)

☐ More than 2 years, but not more than 3 years ago (4)

☐ More than 3 years, but not more than 5 years ago (5)

☐ More than 5 years ago (6)

☐ NEVER HAVE BEEN (7)

Q27 The next questions are about exercise, recreation, or physical activities other than your regular job duties.

In a typical week, other than your regular job, do you do any vigorous-intensity sports, fitness, or recreational activities that cause large increases in breathing or heart rate like running or basketball for at least 10 minutes continuously?

INTERVIEWER NOTE: IF RESPONDENT DOES NOT HAVE A "REGULAR JOB DUTY" OR IS RETIRED, THEY MAY COUNT THEIR PHYSICAL ACTIVITY OR EXERCISE THEY SPEND THE MOST TIME DOING IN A REGULAR MONTH.

- ☐ Yes (1)
- ☐ No (2)

Q28 In a typical week, other than your regular job, do you do any moderate-intensity sports, fitness, or recreational activities that cause small increases in breathing or heart rate such as brisk walking, bicycling, swimming, or golf for at least 10 minutes continuously?

- ☐ Yes (1)
- ☐ No (2)

Q29 Next, I would like to ask you a few questions about your sleep patterns. During the past 30 days, for about how many days have you felt you did not get enough rest or sleep?

INTERVIEWER NOTE: ENTER "0" IF RESPONDENT SAID NONE.

--

Q30 On average, how many hours of sleep do you get in a 24-hour period? Think about the time you actually spend sleeping or napping, not just the amount of sleep you think you should get.

INTERVIEWER NOTE: ENTER HOURS OF SLEEP IN WHOLE NUMBERS, ROUNDING 30 MINUTES (1/2 HOUR) OR MORE UP TO THE NEXT WHOLE HOUR AND DROPPING 29 OR FEWER MINUTES.

--

Q31 Have you ever told a doctor or other health professional that you have trouble sleeping?

- ☐ Yes (1)
- ☐ No (2)

Q32 Have you ever been told by a doctor or other health professional that you have a sleep disorder?

- ☐ Yes (1)
- ☐ No (2)

Q33 Would you like to weigh...

- ☐ More (1)
- ☐ Less (2)
- ☐ Stay about the same (3)

Q34 The next questions ask how you have been feeling during the past 30 days. During the past 30 days, how often did you feel nervous? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q35 During the past 30 days, how often did you feel restless or fidgety? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q36 During the past 30 days, how often did you feel so sad or depressed that nothing could cheer you up? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q37 During the past 30 days, how often did you feel that everything was an effort? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q38 During the past 30 days, how often did you feel down on yourself, no good or worthless? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q39 The last questions asked about how you have been feeling during the past 30 days. Now think about the past 12 months. Was there a month in the past 12 months when you felt more depressed, anxious, or emotionally stressed than you felt during the past 30 days?

- ☐ Yes (1)
- ☐ No (2)

If Q39=2 Then Skip To Q44

A1 Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed...how often did you feel hopeless? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q40 Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed. During that month, how often did you feel nervous? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q41 During that same month when you were at your worst emotionally...how often did you feel restless or fidgety? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q42 During that same month when you were at your worst emotionally . . .how often did you feel so sad or depressed that nothing could cheer you up? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

A2 During that same month when you were at your worst emotionally...how often did you feel that everything was an effort? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q43 During that same month when you were at your worst emotionally . . .how often did you feel down on yourself, no good, or worthless? Would you say...

- ☐ All of the time (1)
- ☐ Most of the time (2)
- ☐ Some of the time (3)
- ☐ A little of the time (4)
- ☐ None of the time (5)

Q44 Now I have a few questions about religion. What religion are you now, if any?

HAND R SHOWCARD 6.

- ☐ None (1)
- ☐ Catholic (2)
- ☐ Jewish (3)
- ☐ Southern Baptist (4)
- ☐ Baptist (5)
- ☐ Methodist or African Methodist (6)
- ☐ Lutheran (7)
- ☐ Presbyterian (8)
- ☐ Episcopal or Anglican (9)
- ☐ Church of Jesus Christ of Latter Day Saints (LDS/Mormon) (10)
- ☐ Other (11)

Q45 Currently, how important is religion in your daily life? Would you say it is very important, somewhat important, or not important?

- ☐ Very important (1)
- ☐ Somewhat important (2)
- ☐ Not important (3)

Q46 About how often do you attend religious services?

HAND R SHOWCARD 7.

- ☐ More than once a week (1)
- ☐ Once a week (2)
- ☐ 2 - 3 times per month (3)
- ☐ Once a month (about 12 times a year) (4)
- ☐ 3 - 11 times a year (5)
- ☐ Once or twice a year (6)
- ☐ Never (7)

Q47 The next questions ask about voting. How often would you say you vote?

- ☐ Never (1)
- ☐ Rarely (2)
- ☐ Sometimes (3)
- ☐ Often (4)

Q48 In talking to people about elections, we often find that a lot of people were not able to vote because they weren't registered, they were sick, or they just didn't have time.

Now think back to the election in 2012, which was a Presidential election. Which of the following statements best describes you:

One, I did not vote in the 2012 Presidential election;

Two, I thought about voting this time, but didn't;

Three, I usually vote, but didn't this time; or

Four, I am sure I voted?

- ☐ I did not vote in the 2012 Presidential election (1)
- ☐ I thought about voting this time, but didn't (2)
- ☐ I usually vote, but didn't this time (3)
- ☐ I am sure I voted (4)
- ☐ N/A (5)

Q49 How about the election for the House of Representatives in Washington. Did you vote for a candidate for the U.S. House of Representatives?

- ☐ Yes, voted for House of Representatives (1)
- ☐ No, didn't vote for House of Representatives (2)
- ☐ N/A (3)

Q50 Now think of the past 12 months, have you done any of the following?

	Yes (1)	No (2)
Recycled used materials such as glass, cans, paper, and clothes (1)	<input type="radio"/>	<input type="radio"/>
Bought fair trade goods or anything in a charity shop (2)	<input type="radio"/>	<input type="radio"/>
Given money or goods to other charitable causes (3)	<input type="radio"/>	<input type="radio"/>
A3 Given money or goods to the homeless? (4)	<input type="radio"/>	<input type="radio"/>
Attended church, synagogue, or mosque almost every week (5)	<input type="radio"/>	<input type="radio"/>

Q51 How often do you use seat belts when you drive or ride a car? Would you say...

- ☐ Always (1)
- ☐ Nearly always (2)
- ☐ Sometimes (3)
- ☐ Seldom (4)
- ☐ Never (5)

Q52 Next I have a few questions about your Internet usage. Have you ever used the Internet or World Wide Web?

- ☐ Yes (1)
- ☐ No (2)

If Q52=2 Then Skip To Q54

Q53 In the past 30 days, how often have you visited a web site for?

	NEVER (1)	1-2 TIMES (2)	3-5 TIMES (3)	MORE THAN 5 TIMES (4)
News and current events (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Television or movies (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health and fitness (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sports (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religion/church related (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q54 We are interested in how people are getting along financially these days. Would you say that you are better off or worse off financially than you were a year ago?

- ☐ Better now (1)
- ☐ Same (2)
- ☐ Worse (3)

Q55 Now looking ahead--do you think that a year from now you will be better off financially, or worse off, or just about the same as now?

- ☐ Will be better off (1)
- ☐ Same (2)
- ☐ Will be worse off (3)



Q56 Now turning to business conditions in the country as a whole--do you think that during the next 12 months we'll have good times financially, or bad times, or what?

- ☐ Good times (1)
- ☐ About the same (2)
- ☐ Bad times (3)

Q57 As to the economic policy of the government--I mean steps taken to fight inflation or unemployment--would you say the government is doing a good job, only fair, or a poor job?

- ☐ Good job (1)
- ☐ Only fair (2)
- ☐ Poor job (3)

Q58 During the next 12 months, do you expect your income to be higher or lower than during the past year?

- ☐ Higher (1)
- ☐ About the same (2)
- ☐ Lower (3)

Q59 What do you think the chances are that your income will increase by more than the rate of inflation during the next five years or so?

Your answers can range from zero to one hundred, where zero means there is absolutely no chance, and one hundred means that it is absolutely certain.

INTERVIEWER NOTE: IF R ASKS FOR AN EXAMPLE OR NEEDS MORE EXPLANATIONS. FOR EXAMPLE, WHEN WEATHER FORECASTERS REPORT THE CHANCE OF RAIN, A NUMBER LIKE 20 PERCENT MEANS "A SMALL CHANCE", A NUMBER AROUND 50 PERCENT MEANS "A PRETTY EVEN CHANCE," AND A NUMBER LIKE 80 PERCENT MEANS "A VERY GOOD CHANCE."

Q60 The next questions are about encounters with the police or the court system. Not counting minor traffic violations, have you ever been arrested and booked for breaking the law?

Being 'booked' means that you were taken into custody and processed by the police or by someone connected with the courts, even if you were then released.

- ☐ Yes (1)
- ☐ No (2)

If Q60=2 Then Skip To Q63

Answer If Q63≠2

Q61 Not counting minor traffic violations, how many times during the past 12 months have you been arrested and booked for breaking a law?

Answer If Q63≠2 And Q64≥1 Or Q63≠2 And Q64 Is Empty

Q62 The next questions are about offenses that are against the law. As I read each question, please answer whether you were arrested and booked for that offense during the past 12 months.

In the past 12 months, were you arrested and booked for...

	Yes (1)	No (2)
Driving under the influence of alcohol or drugs? (1)	<input type="radio"/>	<input type="radio"/>
Fraud, possessing stolen goods, or vandalism? (4)	<input type="radio"/>	<input type="radio"/>

Q63 The next questions are about alcoholic beverages, such as beer, wine, brandy, and mixed drinks. This card lists examples of the types of beverages we are interested in. Please review this list carefully before you answer these questions.

HAND R SHOWCARD 8.

By a "drink," we mean a can or bottle of beer, a glass of wine or a wine cooler, a shot of liquor, or a mixed drink with liquor in it.

Have you ever, even once, had a drink of any type of alcoholic beverage? Please do not include times when you only had a sip or two from a drink.

☐ Yes (1)

☐ No (2)

If Q63=2 Then Skip To Q69

Answer If Q66=1

Q64 Think about the first time you had a drink of an alcoholic beverage. How old were you the first time you had a drink of an alcoholic beverage? Please do not include any time when you only had a sip or two from a drink.

--

Answer If Q66=1

Q65 How long has it been since you last drank an alcoholic beverage?

☐ Within the past 30 days (1)

☐ More than 30 days ago but within the past 12 months (2)

☐ More than 12 months ago (3)

If Q65=2 Then Skip To Q68

If Q65=3 Then Skip To Q68

Answer If Q65=1

A4 On the days that you drank during the past 30 days, how many drinks did you usually have each day? Count as a drink a can or bottle of beer; a wine cooler or a glass of wine, champagne, a sherry; a shot of liquor or a mixed drink or cocktail.

If you didn't drink any alcoholic beverages during the past 30 days, enter 0.

--

Answer If **MALE** And Q65=1

Q66M During the past 30 days, on how many days did you have 5 or more drinks on the same occasion? By "occasion", we mean at the same time or within a couple of hours of each other.

Answer If **FEMALE** And Q65=1

Q66F During the past 30 days, on how many days did you have 4 or more drinks on the same occasion? By "occasion", we mean at the same time or within a couple of hours of each other.

Answer If Q65=1

Q67 During the past 30 days, what is the largest number of drinks you had on any occasion?

Answer If **MALE**

Q68M Was there ever a time or times in your life when you drank 5 or more drinks of any kind of alcoholic beverage almost every day?

- ☐ Yes (1)
- ☐ No (2)

Answer If **FEMALE**

Q68F Was there ever a time or times in your life when you drank 4 or more drinks of any kind of alcoholic beverage almost every day?

- ☐ Yes (1)
- ☐ No (2)

Q69 These next questions are about your use of tobacco products. This includes cigarettes, chewing tobacco, snuff, cigars, and pipe tobacco. The first questions are about cigarettes only. Have you ever smoked part or all of a cigarette?

- ☐ Yes (1)
- ☐ No (2)

If Q69=2 To Q71

Answer Q69=1

Q70 Now think about the past 30 days. During the past 30 days, have you smoked part or all of a cigarette?

- ☐ Yes (1)
- ☐ No (2)

Q71 The next questions are about your use of snuff, sometimes called dip. Snuff is a finely ground form of tobacco that usually comes in a container called a tin. You can use snuff by placing a pinch or dip in your mouth between your lip and gum or between your cheek and gum. Snuff can also be inhaled through the nose. Snuff is sold in both loose form and in ready-to-use packets.

Have you ever used snuff, even once?

- ☐ Yes (1)
- ☐ No (2)

If Q71=2 Then Skip To Q73

Answer If Q71=1

Q72 Now think about the past 30 days. During the past 30 days, have you used snuff, even once?

- ☐ Yes (1)
- ☐ No (2)

Q73 The next questions are only about chewing tobacco. Chewing tobacco is coarsely shredded tobacco that is sold in pouches of loose tobacco leaves or in a “plug” or “twist” form. To use chewing tobacco, you either chew it or hold it in your cheek or inside your lower lip.

Have you ever used chewing tobacco, even once?

- ☐ Yes (1)
- ☐ No (2)

If Q73=2 Then Skip To Q75

Answer If Q73=1

Q74 Now think about the past 30 days. During the past 30 days, have you used chewing tobacco, even once?

- ☐ Yes (1)
- ☐ No (2)

Q75 The next questions are about smoking cigars. By cigars we mean any kind, including big cigars, cigarillos, and even little cigars that look like cigarettes. Have you ever smoked part or all of a cigar?

- ☐ Yes (1)
- ☐ No (2)

If Q75=2 Then Skip To Q77

Answer If Q75=1

Q76 Now think about the past 30 days. During the past 30 days, have you smoked part or all of any type of cigar?

- ☐ Yes (1)
- ☐ No (2)

Q77 The next question is about marijuana and hashish. Marijuana is also called pot or grass. Marijuana is usually smoked, either in cigarettes, called joints, or in a pipe. It is sometimes cooked in food. Hashish is a form of marijuana that is also called “hash.”

It is usually smoked in a pipe. Another form of hashish is hash oil. Have you ever, even once, used marijuana or hashish?

- ☐ Yes (1)
- ☐ No (2)

If Q77=2 Then Skip To Q79

Q79 Sometimes people take tobacco out of a cigar and replace it with marijuana. This is sometimes called a 'blunt'. Have you ever smoked part or all of a cigar with marijuana in it?

- ☐ Yes (1)
- ☐ No (2)

A5 How long has it been since you last smoked part or all of a cigar with marijuana in it?

- ☐ Within the past 30 days (1)
- ☐ More than 30 days ago but within the past 12 months (2)
- ☐ More than 12 months ago (3)

Answer If Q78=1

Q80 The next question is about the use of pain relievers. We are not interested in your use of "over-the-counter" drugs that can be bought in drug stores or grocery stores without a doctor's prescription. We are interested in your use of any form of prescription pain relievers that were not prescribed for you or that you took only for the experience or feeling they caused.

HAND R SHOWCARD 9.

This card lists the names of some different kinds of prescription pain relievers. Please review this card carefully before you answer the question.

Have you ever, even once, used any pain relievers that was not prescribed for you or that you took only for the experience or feeling it caused?

- ☐ Yes (1)
- ☐ No (2)

If Q80=2 Then Skip To B7/Q81

A6 On how many days in the past 12 months did you use any prescription pain reliever that was not prescribed for you or that you took only for the experience or feeling it caused?

--

B7 The next question asks about the use of tranquilizers. Tranquilizers are usually prescribed to relax people, to calm people down, to relieve anxiety, or to relax muscle spasms. Some people call tranquilizers 'nerve pills.' We are interested in your use of any prescription tranquilizers that were not prescribed for you or that you took only for the experience or feeling they caused.

HAND R SHOWCARD 10.

This card lists the names of some different kinds of prescription tranquilizers. Please review this card carefully before you answer the question.

A7 How long has it been since you last used any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?

- ☐ Within the past 30 days (1)
- ☐ More than 30 days ago but within the past 12 months (2)
- ☐ More than 12 months ago (3)

If MALE Answer Q81M to Q87M

Q81M The next questions are about sexual experiences that you may have had with a female.

Here are some things you may have done with a female. If you have ever done this at least one time with a female, answer yes. If you have never done this, answer no.

Have you ever had sexual intercourse with a female (sometimes this is called making love, having sex, or going all the way)?

- ☐ Yes (1)
- ☐ No (2)

Q82M Have you ever put your penis in a female's vagina (also known as vaginal intercourse)?

- ☐ Yes (1)
- ☐ No (2)

Q83M Was a condom used the last time you had vaginal intercourse with a female?

- ☐ Yes (1)
- ☐ No (2)

Q84M The last time you had vaginal intercourse with a female, did you use the condom to...

- ☐ To prevent pregnancy (1)
- ☐ To prevent diseases like syphilis, gonorrhea or AIDS (2)
- ☐ For both reasons (3)
- ☐ Or for some other reason (4)

A8M The very last time you had any type of sex -- that is, vaginal intercourse or anal sex or oral sex -- with a female partner, did you use a condom?

- ☐ Yes (1)
- ☐ No (2)

Q85M Think back to the very first time you had vaginal intercourse with a female. Would you say then that this first vaginal intercourse was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?

- ☐ Voluntary (1)
- ☐ Not voluntary (2)

Q86M Were any of these kinds of force used? Were you given alcohol or drugs?

- ☐ Yes (1)
- ☐ No (2)

A9M How many different females have you ever had intercourse with? This includes any female you had intercourse with, even if it was only once or if you did not know her well.

- ☐ One (1)
- ☐ Two (2)
- ☐ Three (3)
- ☐ Four (4)
- ☐ Five (5)
- ☐ Six (6)
- ☐ 7 or more (7)

Q87M Have you ever had any sexual experience of any kind with another male?

- ☐ Yes (1)
- ☐ No (2)

If FEMALE Answer Q81F to Q87F

Q81F The next questions are about sexual experiences that you may have had with a male.

Here are some things you may have done with a male. If you have ever done this at least one time with a male, answer yes. If you have never done this, answer no.

At any time in your life, have you ever had sexual intercourse with a man, that is, made love, had sex, or gone all the way?

- ☐ Yes (1)
- ☐ No (2)

Q82F Has a male ever put his penis in your vagina (also known as vaginal intercourse)?

- ☐ Yes (1)
- ☐ No (2)

Q83F Was a condom used the last time you had vaginal intercourse with a male?

- ☐ Yes (1)
- ☐ No (2)

Q84F The last time you had vaginal intercourse with a male, did you use the condom to...

- ☐ To prevent pregnancy (1)
- ☐ To prevent diseases like syphilis, gonorrhea or AIDS (2)
- ☐ For both reasons (3)
- ☐ Or for some other reason (4)

A8F The very last time you had any type of sex -- that is, vaginal intercourse or anal sex or oral sex -- with a male partner, did you use a condom?

- ☐ Yes (1)
- ☐ No (2)

Q85F Think back to the very first time you had vaginal intercourse with a male. Would you say then that this first vaginal intercourse was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?

- ☐ Voluntary (1)
- ☐ Not voluntary (2)

Q86F Were any of these kinds of force used? Were you given alcohol or drugs?

- ☐ Yes (1)
- ☐ No (2)

A9F Counting all your male sexual partners, even those you had intercourse with only once, how many men have you had sexual intercourse with in your life?

--

Q87F Have you ever had any sexual experience of any kind with another female?

- ☐ Yes (1)
- ☐ No (2)

A10 When, if ever, was the last occasion you masturbated? That is, aroused yourself sexually?

- ☐ In the past 7 days (1)
- ☐ Between 7 days and 4 weeks ago (2)
- ☐ Between 4 weeks and 6 months ago (3)
- ☐ Between 6 months and 1 year ago (4)
- ☐ Between 1 year and 5 years ago (5)
- ☐ Longer than 5 years ago (6)
- ☐ Never masturbated or aroused myself sexually (7)

Q88 Income is important in analyzing the information we collect. For example, this information helps us to learn whether people in different income groups have different dietary behaviors. Next, I need to know your total earnings before taxes. Will it be easier for you to tell me your total weekly, monthly, or yearly earnings?

- ☐ Weekly (1)
- ☐ Monthly (2)
- ☐ Yearly (3)



Answer If Q88=1

Q89 Which category represents your total weekly earnings before taxes?

HAND R SHOWCARD 11

- ☐ UNDER \$96 (1)
- ☐ \$ 96-143 (2)
- ☐ \$ 144-191 (3)
- ☐ \$ 192-239 (4)
- ☐ \$ 240-288 (5)
- ☐ \$ 289-384 (6)
- ☐ \$ 385-480 (7)
- ☐ \$ 481-576 (8)
- ☐ \$ 577-672 (9)
- ☐ \$ 673-768 (10)
- ☐ \$ 769-961 (11)
- ☐ \$ 962-1,153 (12)
- ☐ \$1,154-1,441 (13)
- ☐ \$1,442 or more (14)

Answer If Q88=2

Q90 Which category represents your total monthly earnings before taxes?

HAND R SHOWCARD 12

- ☐ UNDER \$417 (1)
- ☐ \$ 417-624 (2)
- ☐ \$ 625-832 (3)
- ☐ \$ 833-1041 (4)
- ☐ \$1,042-1,249 (5)
- ☐ \$1,250-1,666 (6)
- ☐ \$1,667-2,082 (7)
- ☐ \$2,083-2,499 (8)
- ☐ \$2,500-2,916 (9)
- ☐ \$2,917-3,332 (10)
- ☐ \$3,333-4,166 (11)
- ☐ \$4,167-4,999 (12)
- ☐ \$5,000-6,249 (13)
- ☐ \$6,250 or more (14)

Answer If Q88=3

Q91 Which category represents your total yearly earnings before taxes?

HAND R SHOWCARD 13

- ☐ UNDER \$5,000 (1)
- ☐ \$ 5,000-7,499 (2)
- ☐ \$ 7,500-9,999 (3)
- ☐ \$10,000-12,499 (4)
- ☐ \$12,500-14,999 (5)
- ☐ \$15,000-19,999 (6)
- ☐ \$20,000-24,999 (7)
- ☐ \$25,000-29,999 (8)
- ☐ \$30,000-34,999 (9)
- ☐ \$35,000-39,999 (10)
- ☐ \$40,000-49,999 (11)
- ☐ \$50,000-59,999 (12)
- ☐ \$60,000-74,999 (13)
- ☐ \$75,000 or more (14)

Answer If Q88 Is Empty Or Q89 Is Empty Or Q90 Is Empty Or Q91 Is Empty

Q92 Was it \$20,000 or more per year?

- ☐ Yes (1)
- ☐ No (2)

Answer If Q92=1

Q93 Was it \$50,000 or more per year?

- ☐ Yes (1)
- ☐ No (2)

Answer If Q93=1

Q94 Was it \$75,000 or more per year?

- ☐ Yes (1)
- ☐ No (2)

Q95 Next I have some questions about your demographic information. What is your age?

Q96 What is the highest grade or level of school you have completed or the highest degree you have received?

HAND R SHOWCARD 14.

INTERVIEWER NOTE: ENTER HIGHEST LEVEL OF SCHOOL.

- ☐ Never attended/Kindergarten only (1)
- ☐ 1st Grade (2)
- ☐ 2nd Grade (3)
- ☐ 3rd Grade (4)
- ☐ 4th Grade (5)
- ☐ 5th Grade (6)
- ☐ 6th Grade (7)
- ☐ 7th Grade (8)
- ☐ 8th Grade (9)
- ☐ 9th Grade (10)
- ☐ 10th Grade (11)
- ☐ 11th Grade (12)
- ☐ 12th Grade, no diploma (13)
- ☐ High school graduate (14)
- ☐ GED or equivalent (15)
- ☐ Some college, no degree (16)
- ☐ Associated degree: Occupational, technical, or vocational program (17)
- ☐ Associated degree: Academic program (18)
- ☐ Bachelor's degree (example: BA, AB, BS, BBA) (19)
- ☐ Master's degree (example: MA, MS, MEng, MEd, MBA) (20)
- ☐ Professional school degree (example: MD, DDS, DVM, JD) (21)
- ☐ Doctoral degree (example: PhD, EdD) (22)

Q97M Are you Hispanic or Latino, or of Spanish origin?

- ☐ Yes (1)
- ☐ No (2)

Q97F Are you Hispanic or Latina, or of Spanish origin?

- ☐ Yes (1)
- ☐ No (2)

Q98 Which one of the following groups would you say best describes your racial background?

HAND R SHOWCARD 15.

- ☐ White (1)
- ☐ Black or African American (2)
- ☐ Asian (3)
- ☐ Native Hawaiian or Other Pacific Islander (4)
- ☐ American Indian or Alaska Native (5)
- ☐ MIXED OR OTHER (IF VOLUNTEERED)

Q99 What is your current marital status? Are you...

HAND R SHOWCARD 16.

- ☐ Married (1)
- ☐ Not married but living together with a partner (2)
- ☐ Widowed (3)
- ☐ Divorced (4)
- ☐ Separated (5)
- ☐ Never been married (6)

Q100 About how tall are you without shoes?

INTERVIEWER NOTE: ENTER HEIGHT IN WHOLE NUMBERS, ROUNDING 0.5 OR MORE UP TO THE NEXT WHOLE NUMBER AND DROPPING 0.4 OR FEWER.

Q188 About how tall are you without shoes?

INTERVIEWER NOTE: CHECK ALL UNITS THAT APPLY AND THEN ENTER THE QUANTITY)

- ☐ FEET (1) \_\_\_\_\_
- ☐ INCHES (2) \_\_\_\_\_
- ☐ METERS (3) \_\_\_\_\_
- ☐ CENTIMETERS (4) \_\_\_\_\_

Answer If MALE

A11M About how much do you weigh without shoes?

ENTER QUANTITY	ENTER UNIT	
QUANTITY (1)	POUNDS (1)	KILOGRAMS (2)
<input type="text"/>	<input type="radio"/>	<input type="radio"/>

Answer If FEMALE

A11F About how much do you weigh without shoes? If you are currently pregnant, provide your weight before pregnancy.

ENTER QUANTITY	ENTER UNIT	
QUANTITY (1)	POUNDS (1)	KILOGRAMS (2)
<input type="text"/>	<input type="radio"/>	<input type="radio"/>

**ACASI (Audio Computer-Assisted Self-Interviewing)**

**INTRO1** Welcome to the self-interviewing system, which lets you control the interview and answer in complete privacy. First, you will learn how to use the system and complete some practice questions. You will learn how to enter answers and how to back up if you make a mistake and want to change an answer. Click [NEXT] to move to the next screen.

**INTRO2** In this system you can read the questions on the computer screen and hear them read through the headphones. During the reading of the question, the [NEXT]

button will be disabled. Once the reading is over, the [NEXT] button will be enabled. Please put on your headphones and click [NEXT] to continue.

**PRAC1** To answer a question, you first move the mouse to the circle that is shown next to your answer and then left click the mouse to select it.

In what month were you born?

- ☐ January
- ☐ February
- ☐ March
- ☐ April
- ☐ May
- ☐ June
- ☐ July
- ☐ August
- ☐ September
- ☐ October
- ☐ November
- ☐ December

**PRAC2** Other questions will ask you to type in a number instead of choosing a number from a list.

In what year were you born? Please enter the 4-digit year you were born in the text box below and click [NEXT].

**INTRO3** If you want to change or see your answer to a previous question, you can click the [BACK] button. Each time you click [BACK], the computer will go back one question. Click [NEXT] to continue.

**INTRO4** If you do not know the answer to a question or do not wish to answer a particular question, click [NEXT] to skip to the next question. Please click [NEXT] to continue.

**PRAC3** For some of the questions, the computer can only accept certain answers. For example, in the question below, the numbers the computer will accept are from 50 to 995. If you try to enter numbers not between 50 to 995, an instruction box will appear on top of the screen in red when you click [NEXT]. To correct your answer, enter a number within the range 50 to 995. Try this with the question below. Type 45 as your answer.

How much do you weigh? Please answer in pounds and then click [NEXT]

**INTRO5** Sometimes a reminder box will appear on the screen if you click [NEXT] without answering the question. On the reminder box, you can click [Answer the Question] to provide an answer. Or you can click [Continue without Answering] to skip to the next question. Click [NEXT] to continue.

**INTRO6** If you have any questions about how to use the computer, please ask your interviewer now. Otherwise, please click [NEXT] to continue on your own.

**INTRO7** The next questions are about alcoholic beverages, such as beer, wine, brandy, and mixed drinks. Listed on the next screen are examples of the types of beverages we are interested in. Please review this list carefully before you answer these questions.  
Click [NEXT] to continue.

**INTRO8** Please review this list carefully before you click [NEXT] to continue.

**INTRO9** These questions are about drinks of alcoholic beverages. Throughout these questions, by a “drink,” we mean a can or bottle of beer, a glass of wine or a wine cooler, a shot of liquor, or a mixed drink with liquor in it. We are not asking about times when you only had a sip or two from a drink.  
Click [NEXT] to continue.

**Q1** Now think about the past 12 months. We want to know how many days you’ve had a drink of an alcoholic beverage during the past 12 months.  
What would be the easiest way for you to tell us how many days you drank alcoholic beverages?

- ☐ Average number of days per week during the past 12 months
- ☐ Average number of days per month during the past 12 months
- ☐ Total number of days during the past 12 months

**Q2** On how many days in the past 12 months did you drink an alcoholic beverage?

**Q3** On average, how many days did you drink an alcoholic beverage each month during the past 12 months?

**Q4** On average, how many days did you drink an alcoholic beverage each week during the past 12 months?

**Q5** Think specifically about the past 30 days. During the past 30 days, on how many days did you drink one or more drinks of an alcoholic beverage?

**Q7** During the past 12 months, have you driven a vehicle while you were under the influence of alcohol?

- ☐ Yes
- ☐ No

**INTRO10** The next questions are about marijuana and hashish. Marijuana is also called pot or grass. Marijuana is usually smoked, either in cigarettes, called joints, or in a pipe. It is sometimes cooked in food. Hashish is a form of marijuana that is also called “hash.” It is usually smoked in a pipe. Another form of hashish is hash oil. Click [NEXT] to continue.

**Q8** How long has it been since you last used marijuana or hashish?

- ☐ Within the past 30 days
- ☐ More than 30 days ago but within the past 12 months
- ☐ More than 12 months ago
- ☐ Never used marijuana or hashish

**Q9** Now think about the past 12 months. We want to know how many days you’ve used marijuana or hashish during the past 12 months.

What would be the easiest way for you to tell us how many days you have used it?

- ☐ Average number of days per week during the past 12 months
- ☐ Average number of days per month during the past 12 months
- ☐ Total number of days during the past 12 months

**Q10** On how many days in the past 12 months did you use marijuana or hashish?

**Q11** On average, how many days did you use marijuana or hashish each month during the past 12 months?

**Q12** On average, how many days did you use marijuana or hashish each week during the past 12 months?

**Q14** Sometimes people take tobacco out of a cigar and replace it with marijuana. This is sometimes called a ‘blunt’. On how many of the past 30 days, did you smoke part or all of a cigar with marijuana in it?

**INTRO13** The next questions ask about the use of tranquilizers. Tranquilizers are usually prescribed to relax people, to calm people down, to relieve anxiety, or to relax muscle spasms. Some people call tranquilizers ‘nerve pills.’ We are interested in your use of any prescription tranquilizers that were not prescribed for you, or that you took only for the experience or feeling they caused. Click [NEXT] to continue.

**INTRO14** Here lists the names of some different kinds of prescription tranquilizers. Please review this list carefully before you click [NEXT] to continue.

**Q16** Have you ever, even once, used any tranquilizers that were not prescribed for you or that you took only for the experience or feeling it caused?

- ☐ Yes
- ☐ No

**Q18** Now think about the past 12 months. We want to know how many days you have used any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused during the past 12 months.

What would be the easiest way for you to tell us how many days you used a prescription tranquilizer in either of these ways?

- ☐ Average number of days per week during the past 12 months
- ☐ Average number of days per month during the past 12 months
- ☐ Total number of days during the past 12 months

**Q19** On how many days in the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?

**Q20** On average, how many days each month during the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?

**Q21** On average, how many days each week during the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?

**INTRO15M** The next questions are about sexual experiences that you may have had with a female. Here are some things you may have done with a female. If you have ever done this at least one time with a female, answer yes. If you have never done this, answer no.  
Please click [NEXT] to continue.

**Q22M** Have you ever put your penis in a female's vagina (also known as vaginal intercourse)?

- ☐ Yes
- ☐ No

**Q23M** The first time this occurred, how old were you?

**Q24M** The first time this occurred, how old was she?



**Q25M** The next question is about oral sex. By oral sex, we mean stimulating the genitals with the mouth. Did you use a condom the last time a female performed oral sex on you?

- ☐ Yes
- ☐ No
- ☐ Never had oral sex

**Q26M** Have you ever put your penis in a female's rectum or butt (also known as anal sex)?

- ☐ Yes
- ☐ No

**Q27M** As you know, some people have had sexual intercourse by your age and others have not. What would you say is the most important reason why you have not had sexual intercourse up to now?

- ☐ Against religion or morals
- ☐ Don't want to get a female pregnant
- ☐ Don't want to get a sexually transmitted disease
- ☐ Haven't found the right person yet
- ☐ In a relationship, but waiting for the right time
- ☐ Other

**Q29M** Think back to the very first time you had vaginal intercourse with a female. Would you say then that this first vaginal intercourse was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?

- ☐ Voluntary
- ☐ Not voluntary

**Q30M** Were any of these kinds of force used?

Did you do what she said because she was bigger than you or a grown-up, and you were young?

- ☐ Yes
- ☐ No

**Q31M** Were you threatened with physical hurt or injury?

- ☐ Yes
- ☐ No

**Q32M** Were you physically hurt or injured?

- ☐ Yes
- ☐ No

**Q33M** Were you physically held down?

- ☐ Yes
- ☐ No

**Q34M** Besides the time you already reported, have you ever been forced by a female to have vaginal intercourse against your will?

- ☐ Yes  
☐ No

**Q36M** Thinking about the last 12 months, how many female sex partners have you had in the 12 months? Please count every partner, even those you had sex with only once in those 12 months.

**Q37M** In the last 12 months, did you have sex with any females who were also having sex with other people at around the same time?

- ☐ Yes  
☐ No

**Q38M** The next questions ask about sexual experiences you may have had with another male. Have you ever performed oral sex on another male, that is, stimulated his penis with your mouth?

- ☐ Yes  
☐ No

**Q39M** Has another male ever performed oral sex on you, that is, stimulated your penis with his mouth?

- ☐ Yes  
☐ No

**INTRO15F** The next questions are about sexual experiences that you may have had with a male. Here are some things you may have done with a male. If you have ever done this at least one time with a male, answer yes. If you have never done this, answer no.

Please click [NEXT] to continue.

**Q22F** Has a male ever put his penis in your vagina (also known as vaginal intercourse)?

- ☐ Yes  
☐ No

**Q23F** The first time this occurred, how old were you?

**Q24F** The first time this occurred, how old was he?

**Q25F** The next question is about oral sex. By oral sex, we mean stimulating the genitals with the mouth. Was a condom used the last time you performed oral sex on a male?

- ☐ Yes
- ☐ No
- ☐ Never had oral sex

**Q26F** Has a male ever put his penis in your rectum or butt (also known as anal sex)?

- ☐ Yes
- ☐ No

**Q27F** As you know, some people have had sexual intercourse by your age and others have not. What would you say is the most important reason why you have not had sexual intercourse up to now?

- ☐ Against religion or morals
- ☐ Don't want to get pregnant
- ☐ Don't want to get a sexually transmitted disease
- ☐ Haven't found the right person yet
- ☐ In a relationship, but waiting for the right time
- ☐ Other

**Q29F** Think back to the very first time you had vaginal intercourse with a male. Would you say then that this first vaginal intercourse was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?

- ☐ Voluntary
- ☐ Not voluntary

**Q30F** Were any of these kinds of force used? Did you do what he said because he was bigger than you or a grown-up, and you were young?

- ☐ Yes
- ☐ No

**Q31F** Were you threatened with physical hurt or injury?

- ☐ Yes
- ☐ No

**Q32F** Were you physically hurt or injured?

- ☐ Yes
- ☐ No

**Q33F** Were you physically held down?

- ☐ Yes
- ☐ No

**Q34F** Besides the time you already reported, have you ever been forced by a male to have vaginal intercourse against your will?

- ☐ Yes
- ☐ No

**Q36F** Thinking about the last 12 months, how many male sex partners have you had in the 12 months? Please count every partner, even those you had sex with only once in those 12 months.

--

**Q37F** In the last 12 months, did you have sex with any males who were also having sex with other people at around the same time?

- ☐ Yes
- ☐ No

**Q38F** The next questions ask about sexual experiences you may have had with another female. Have you ever performed oral sex on another female?

- ☐ Yes
- ☐ No

**Q39F** Has another female ever performed oral sex on you?

- ☐ Yes
- ☐ No

**Q41** In the past 30 days, how often have you visited a web site for sexually explicit material?

- ☐ Never
- ☐ 1-2 times
- ☐ 3-5 times
- ☐ More than 5 times

**Q42** The next question asks how you have been feeling during the past 30 days. During the past 30 days, how often did you feel hopeless? Would you say...

- ☐ All of the time
- ☐ Most of the time
- ☐ Some of the time
- ☐ A little of the time
- ☐ None of the time

**Q45** Are you now taking medicine or receiving treatment from a doctor or other health professional for any type of mental health condition or emotional problem?

- ☐ Yes
- ☐ No

**Q48** Do you consider yourself now to be...

- ☐ Overweight
- ☐ Underweight
- ☐ About the right weight

**Q49** Being 'booked' means that you were taken into custody and processed by the police or by someone connected with the courts, even if you were then released. In the past 12 months, were you arrested and booked for drunkenness or other liquor law violations?

- ☐ Yes
- ☐ No

## Appendix J: Respondent Debriefing Items for CAPI/Video-mediated Interviews

QCD1 The next questions ask about the interaction you just experienced between you and your interviewer. Click [NEXT] to continue.

QCD2 Please indicate on this scale to what extent the following words or phrases describe how you feel about your interviewer?

	Not at all 1	2	3	4	5	6	To a very great extent 7
Friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Similar to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Standoffish (distant and cold in manner)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easy to talk to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfamiliar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approachable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hard to get along with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trustworthy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aloof (not friendly or forthcoming)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outgoing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unreliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QCD3 Please rate the interaction you just experienced between you and your interviewer on each of the characteristics listed.

	Not at all 1	2	3	4	5	6	To a very great extent 7
Well-coordinated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooperative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Harmonious (gets along well with others)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Satisfying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comfortably paced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cold	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Awkward	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engrossing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Focused	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Involving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Active	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Positive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dull	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worthwhile	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QCD4 Did you find the topics in this interview to be interesting?

- ☐ Not at all interesting 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ Extremely interesting 5

QCD5 How much did you enjoy taking part in this interview?

- ☐ Not at all enjoyed 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ Very much enjoyed 5

QCD6 How comfortable were you with this interview?

- ☐ Not at all comfortable 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ Extremely comfortable 5



## Appendix K: Respondent Debriefing Items for ACASI

QAD\_intro The entire study includes two parts. In Part 1, you interacted with an interviewer. In Part 2, you answered audio-recorded questions on a computer. The next questions ask about your experience answering the audio-recorded questions on the computer. That is, your experience with the Part 2 of the study. Click [NEXT] to continue.

QAD1 How similar was completing this voice recorded interview in Part 2 to interacting with the interviewer in Part 1?

- ☐ Not at all similar 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ Extremely similar 5

QAD2 Thinking of your experience answering the audio-recorded questions on the computer. How similar did the voice on the computer sound to the voice of the interviewer in Part 1?

- ☐ Not at all similar 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ Extremely similar 5

QAD3 Thinking of your experience answering the voice recorded questions on the computer. How much did you enjoy taking part in this voice recorded interview?

- ☐ Not at all enjoyed 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ Extremely enjoyed 5

QAD4 Thinking of your experience answering the voice recorded questions on the computer. Did you find the topics in this part to be interesting?

- ☐ Not at all interesting 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ Extremely interesting 5

QAD5 Thinking of your experience answering the voice recorded questions on the computer. How much privacy did you feel you had during this voice recorded interview?

- ☐ Not at all private 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ Extremely private 5

QAD6 Thinking of your experience answering the voice recorded questions on the computer. How concerned are you about the interviewer in Part 1 finding out how you answered the questions during this voice recorded interview?

- ☐ Not at all concerned 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ Extremely concerned 5

QAD7 Thinking of your experience answering the voice recorded questions on the computer. How comfortable were you with this voice recorded interview?

- ☐ Not at all comfortable 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ Extremely comfortable 5

## Appendix L: Interviewer Debriefing Items

IO1 The next questions ask about the interaction you just experienced with your respondent. Click [NEXT] to continue.

IO2 Please indicate on this scale to what extent the following words or phrases describe how you feel about your respondent?

	Not at all 1	2	3	4	5	6	To a very great extent 7
Friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Similar to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Standoffish (distant and cold in manner)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easy to talk to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfamiliar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approachable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hard to get along with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trustworthy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aloof (not friendly or forthcoming)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outgoing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unreliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

IO3 Please rate the interaction you just experienced between you and your respondent on each of the characteristics listed.

	Not at all 1	2	3	4	5	6	To a very great extent 7
Well-coordinated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooperative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Harmonious (gets along well with others)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Satisfying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comfortably paced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cold	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Awkward	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engrossing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Focused	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Involving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Active	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Positive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dull	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worthwhile	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

IO4 Do you feel the respondent was honest with you, even when he/she felt uneasy about answering?

☐ Yes

☐ No

IO5 Are there any other observations you would like to share?

## Appendix M: Email Invitation and On-campus Flyers

Dear UM Employee,

The Program in Survey Methodology at the University of Michigan needs **your** help to improve our understanding of the health and social lives of UM employees. The study will be conducted in the Survey Research Center (SRC) in the Institute for Social Research (ISR). It will take approximately one hour and eligible **participants** will be compensated \$15 cash for their time. As a participant, you will first take part in an interview, then complete a short questionnaire about the interview, and will finally complete a questionnaire on a computer. The subject concerns health, including sexual health, and social activities. All information you give us is voluntary and will be kept in the strictest confidence. **Participants** must be full-time employees at the University of Michigan to be considered eligible to **participate**.

If you would like to **participate** in this research study or if you have questions, please email [mesh-project@umich.edu](mailto:mesh-project@umich.edu).

The Institute for Social Research (ISR), at the University of Michigan is a member of the Council of American Survey Research Organizations (CASRO) and as such will following the CASRO Code of Ethics (<http://www.casro.org/codeofstandards.cfm>). ISR will maintain "identifier" information (e.g., name, telephone numbers, email addresses) solely for the purpose of conducting the study, and will destroy that information once its work has been completed. No identifiers will be asked in the questionnaire, and no identifiers will be linked to survey responses. If we write a report or article about this research project, **your** identity will be protected to the maximum extent possible. **Your** responses will be grouped with data provided by others for the purposes of reporting the study results.

You received this email because you are part of a random sample of U-M employees. **Your participation** in this research is completely voluntary. You may choose not to take part at all. If you decide to **participate** in this research, you may stop **participating** at any time. If you decide not to **participate** in this study or if you stop **participating** at any time, you will not be penalized or lose any benefits to which you otherwise qualify. **Your** employment status at the University of Michigan will not be affected by **your participation** or non-**participation** in this study, and this study is not connected in any way with the MHealthy project or University Human Resources.

This research is being conducted by Dr. Frederick Conrad at the Program in Survey Methodology, University of Michigan, Dr. Frauke Kreuter, and Ph.D. Candidate Hanyu Sun at the Joint Program in Survey Methodology, University of Maryland. It is a dissertation research, and the joint program is a cooperative effort between UM and Maryland.

If you would like to **participate** in this research study or if you have questions, please email [mesh-project@umich.edu](mailto:mesh-project@umich.edu).

This project was approved by the University of Michigan IRB (HUM00084929) and the University of Maryland IRB (510324-1).



# Program in Survey Methodology

Michigan Employee Study of Health

**Are you employee of the  
University of Michigan age  
18+?**

**You may receive \$15 to  
participate in a study on health  
and social life.**

The Program in Survey Methodology at the University of Michigan needs your help to improve our understanding of the health and social lives of UM employees.

The study will take approximately one hour and eligible participants will be reimbursed \$15 cash for their time. The study will be conducted at the Survey Research Operations (SRO) at the Survey Research Center (SRC), Institute for Social Research (ISR), University of Michigan.

For more information and to determine eligibility, please email [mesh-project@umich.edu](mailto:mesh-project@umich.edu)

## Appendix N: Respondent Debriefing Statement

Thank you very much for taking the time to participate in this study. The purpose of this study is to investigate rapport between the interviewer and the respondent and its impact on disclosure of sensitive information. The study will examine three issues: (1) whether rapport can be similarly established in video-mediated and computer-assisted personal interviews (CAPI), in which the interviewer reads questions displayed on a laptop computer and inputs the answers; (2) whether video-mediated interviews increase disclosure of moderately sensitive information (such as dietary behaviors, mental health, and physical activities) to the same extent as CAPI; and (3) whether the interviewer-respondent interaction prior to the audio-CASI questions may affect disclosure in audio-CASI. In an audio-CASI interview, the computer displays a question on screen and simultaneously plays an audio recording of the question to the respondent. Respondents are randomly assigned to one of the experimental conditions at recruitment.

In order to make all participants behave naturally and avoid any demand characteristics the purpose of the study was not given at recruitment. Demand characteristics are experimental artifacts where participants form an interpretation of the experiment's purpose and unconsciously change their behavior to fit that interpretation. We hide the true purpose of the study from all participants in order to conceal the research hypotheses and let participants behave naturally. This allows us to minimize the effect of any demand characteristics and investigate rapport and its impact on disclosure of sensitive information.

All the information you provided in this study will be kept in the strictest confidence. Institute for Social Research (ISR), University of Michigan is a member of the Council of American Survey Research Organizations (CASRO) and as such will following the CASRO Code of Ethics (<http://www.casro.org/codeofstandards.cfm>). ISR will maintain "identifier" information (e.g., name, telephone numbers, email addresses) solely for the purpose of conducting the study, and will destroy that information once its work has been completed. No identifiers will be linked to the survey responses. And all identifying information will be removed from the digital audio recordings. Access to the data and associated digital audio-recordings are restricted to Dr. Fred Conrad, Dr. Frauke Kreuter, and Hanyu Sun.

Any potential loss of confidentiality will be minimized by storing data in a password protected University network with multiple layers of security. The control administrators have over users and resources help keep sensitive data secure by blocking unauthorized access in real-time. If we write a report or article about this research project, your identity will be protected to the maximum extent possible. Your responses will be grouped with data provided by others for the purposes of reporting the study results.

If you would like to withdraw your data from the study at this time, please let us know. If you have questions, concerns, or complaints, or if you need to report an injury related to the research, please contact the investigator:

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Thank you for your participation.

Here is a list of resources if you would like to seek help for depression, suicidality, alcoholism, substance abuse, or rape and sexual assault.

NDMDA Depression Hotline – Support Group	800-826-3632
National Suicide Prevention Lifeline	800-273-8255
Suicide Prevention Services Crisis Hotline	800-784-2433
Suicide Prevention Services Depression Hotline	630-482-9696
Crisis Help Line – For Any Kind of Crisis	800-233-4357
Sexual Assault Hotline (24/7, English & Spanish)	800-223-5001
Suicide & Depression Hotline – Covenant House	800-999-9999
National Domestic Violence Hotline (TDD)	800-787-3224
American Social Health Association: Sexually Transmitted Disease Hotline	800-227-8922
Alcohol Hotline	800-331-2900
Al-Anon for Families of Alcoholics	800-344-2666
Alcohol and Drug Helpline	800-821-4357
Alcohol Treatment Referral Hotline	800-252-6465
Alcohol & Drug Abuse Hotline	800-729-6686
America Social Health: STD Hotline	800-227-8922
Rape, Abuse, and Incest National Network (RAINN)	800-656-4673
National Domestic Violence/Child Abuse/ Sexual Abuse	800-799-7233
Abuse Victim Hotline	866-662-4535
National Institute on Drug Abuse Hotline	800-662-4357
National Help Line for Substance Abuse	800-262-2463



## Appendix O: Interviewer Debriefing Statement

Thank you very much for taking the time to participate in this study. The purpose of this study is to investigate rapport between the interviewer and the respondent and its impact on disclosure of sensitive information. The study will examine three issues: (1) whether rapport can be similarly established in video-mediated and computer-assisted personal interviews (CAPI), in which the interviewer reads questions displayed on a laptop computer and inputs the answers; (2) whether video-mediated interviews increase disclosure of moderately sensitive information (such as dietary behaviors, mental health, and physical activities) to the same extent as CAPI; and (3) whether the interviewer-respondent interaction prior to the audio-CASI questions may affect disclosure in audio-CASI. In an audio-CASI interview, the computer displays a question on screen and simultaneously plays an audio recording of the question to the respondent. Respondents are randomly assigned to one of the experimental conditions at recruitment.

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If you would like to withdraw your data from the study at this time, please let us know. If you have questions, concerns, or complaints, or if you need to report an injury related to the research, please contact the investigators:

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Thank you for your participation.

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