How Electronic Devices in Face-to-Face Interviews Change Survey Behavior:
Evidence from a Developing Country

Sarah Sunn Bush*  Lauren Prather†

Word Count: 8,733

---

*Sarah Sunn Bush (sarah.bush@temple.edu) is assistant professor in the Department of Political Science, Temple University, 1115 Polett Walk, Gladfelter Hall 455, Philadelphia, PA 19122.

†Lauren Prather (lprather@ucsd.edu) is assistant professor in the School of Global Policy and Strategy, University of California, San Diego, 9500 Gilman Drive, #0519, La Jolla, CA 92093.
Abstract

A large literature shows that survey mode significantly affects item non-response and response distributions. Yet as researchers increasingly conduct surveys in the developing world, little attention has been devoted to understanding how survey mode—such as the use of electronic devices in face-to-face interviews—produces bias there. We hypothesize that using electronic devices instead of pen and paper can affect survey behavior via two pathways: a wealth effect and a surveillance effect. To test the hypotheses, we use data from a two-wave panel survey fielded in Tunisia. We investigate whether responses collected in Wave 1 with pen and paper changed when some individuals were interviewed in Wave 2 by interviewers using tablet computers. Consistent with the wealth effect hypothesis, more than half of the poorest respondents reported a higher income in the second wave when interviewers used tablets. Conversely, we find little evidence that concerns about surveillance changed survey behavior.
Survey research in the developing world is typically conducted via face-to-face interviews. Traditionally, interviewers used paper-assisted personal interviewing (PAPI) to record responses, which would later be converted to a machine-readable format that researchers could analyze. More recently, researchers increasingly employ computer-assisted personal interviewing (CAPI), using electronic devices, such as tablets, smart phones, laptop computers, and personal digital assistants, to record responses during face-to-face interviews. This switch from PAPI to CAPI has a number of advantages, but also changes certain aspects of the survey interview such as hiring more experienced enumerators who are able to use personal computing devices and ensure their security. Moreover, CAPI devices are typically rare in developing country contexts where they are increasingly used. Thus, we ask how does the use of CAPI in face-to-face interviews affect survey behavior in the developing world? The theory and results presented herein are relevant to any researcher using CAPI devices in future work.

CAPI is now used by many leading public opinion projects that rely on face-to-face interviews, such as the World Values Survey\(^1\) and AmericasBarometer (Montalvo, Seligson and Zechmeister forthcoming). In addition to these large-scale public opinion projects, independent researchers have produced high-quality studies using CAPI across the developing world in such diverse places as Bangladesh (Dietrich, Mahmud and Winters 2018), Lesotho (Clayton forthcoming), and Peru (Hawkins et al. 2017) to name a few. A March 2017 survey that we conducted of 76 political scientists who have fielded at least one survey in the developing world in the past five years confirmed the rising importance of CAPI, though it also

made clear that traditional pen-and-paper methods still play an important role. Specifically, 84 percent of those surveyed reported having conducted their last survey using face-to-face methods. Of those, 53 percent reported that their survey involved CAPI, either on its own or in combination with PAPI methods.²

Researchers who field surveys in developing countries are switching to CAPI for a number of reasons. First, collecting data via electronic devices is typically faster and cheaper because it obviates the need for data entry and cleaning. Second, data collection via electronic devices is less prone to the errors that result when survey responses are converted into a machine-readable format. Third, researchers can more easily monitor data quality while computer-assisted interviewers are in the field since CAPI interviewers typically upload completed questionnaires to a common server each day, if not continually. Electronic devices have thus been effective at monitoring and adjusting in response to interviewer fraud (Montalvo, Seligson and Zechmeister forthcoming, 9). Finally, using electronic devices makes it easier for researchers to implement complex questionnaires. For example, when PAPI surveys involve experiments, treatment assignment is often done by the interviewers in the field, such as by rolling dice to determine which questionnaire to use or randomly ordering the paper questionnaires. Such procedures do not always get implemented properly in the field due to researcher error or interviewers’ misunderstandings about the logic of experimentation.³ In the latter case, preventing such misunderstanding often requires extensive training.⁴

²For more details of this survey, see the Supporting Information (SI).
³For an example of this problem in a PAPI survey, see Bush and Jamal (2015, 39).
⁴For example, in the first wave of the survey described below, we conducted a PAPI-based survey experiment on perceptions of election credibility (Authors). Interviewers assigned respondents to the treatments by rolling dice. The randomization process produced experimental groups that were balanced on key pre-treatment covariates. However, it required us to conduct a longer period of training than was typical since few, if any, of our interviewers
contrast, CAPI interviewers do not have to assign subjects to the experimental conditions themselves. Instead, survey software programs automatically manage randomization procedures as well as other complex elements, such as skipping patterns.

Despite its increasing use in the developing world, to our knowledge our study is the first to examine the effects of CAPI on survey behavior in developing countries.\(^5\) Our study is necessary as previous research on survey mode suggests that mode can significantly affect respondents’ behavior. Thus, there is an important need to examine how the rise of CAPI affects two critical elements of survey research: item non-response (i.e., whether people answer questions) and response distributions (i.e., how people answer questions).

We develop four hypotheses drawn from the literature on survey mode. The hypotheses are grounded in two observations about electronic devices. First, CAPI involves a technology that is expensive and uncommon in many developing countries. The presence of electronic devices could therefore prime respondents to think about wealth and the wealthy and cause respondents to perceive the interviewer as higher status. This effect generates greater social distance between interviewer and respondent and leads relatively poor respondents to refuse were familiar with experiments, despite being experienced survey interviewers.

\(^5\)Studies in the 1990s first began to examine the effects of CAPI on survey behavior but were limited to the American context. These studies compared CAPI to other survey methods, where CAPI in these studies was defined as the use of personal laptop computers during survey interviews. Most of these studies focused on the effects of self-administered surveys on survey behavior rather than the presence of computers during face-to-face interviews. See Baker (1992), Baker and Johnson (1995) and Tourangeau and Smith (1996). A more recent literature has emerged also comparing CAPI and PAPI, but it mainly focuses on issues related to implementation, such as survey length and measurement error and not respondent behavior. See Escandon et al. (2008); Onono et al. (2011); Caeyers, Chalmers and de Weert (2012); Leisher (2014).
to answer questions related to income or to report higher incomes than they would otherwise. Second, CAPI involves a technology that could be used to discreetly record audio or video content. The possibility of surveillance via electronic devices could affect responses to sensitive political questions. For example, we suggest that the fear of surveillance will cause respondents who oppose the government to refuse to answer questions related to their support for the government and, if they do answer those questions, to report greater support than they would otherwise. These effects may be particularly prevalent in authoritarian contexts. Given the centrality of accurate measures of income and government satisfaction for many research questions in political science, this study examines whether asking questions using CAPI yielded different results than asking questions using PAPI.

To examine these hypotheses, we exploit variation in the use of CAPI and PAPI methods in the fielding of a nationally-representative panel survey of political attitudes in Tunisia. At the time of our survey (2014), Tunisia was an appropriate case since economic issues and inequality were salient and the country was transitioning from a surveillance state to democracy. While the survey was not specifically designed to examine how CAPI changes survey behavior, we can leverage the questions in the survey and two facts about the survey design to gain causal traction on our hypotheses. Specifically, in the first wave of the survey, interviewers conducted all interviews in person and recorded responses using pen and paper. In the second wave, however, the head interviewer of each team recorded responses with hand-held tablets; the rest of the interviewers used pen and paper again. Crucially, in the first wave of the survey, interviewers were assigned at random to survey respondents, and the same interviewers generally followed-up with the same respondents in the second wave. Given the random assignment of interviewers to respondents, we can plausibly conclude that tablets were assigned to respondents independent of their individual characteristics.\textsuperscript{6} Thus, we can analyze within-subject variation across the first and second waves as well as

\textsuperscript{6}We also test for balance and control for factors that are not balanced in our models.
between-subject variation in the second wave.

We find that CAPI generally did not affect item non-response, but we identify a significant effect on response distributions: Individuals in the lowest income category as recorded in Wave 1 reported significantly higher incomes when interviewed using tablets in Wave 2. This CAPI effect is consistent with our hypothesis that electronic devices increase the social distance between interviewer and respondent, introducing bias as relatively poor respondents change their responses to the income question to bridge that distance. In contrast, tablets did not cause people to report greater support for incumbent politicians or avoid answering questions about them in significantly greater numbers.

The CAPI effect on reported income is noteworthy and suggests that researchers should think carefully about survey mode when seeking to accurately measure this core concept. Our survey of survey researchers suggests that scholars may already suspect that tablets introduce bias: One individual specifically worried about bias in developing countries, writing in an open-ended response that electronic devices “generate additional social desirability bias because they are so rare.” Although our null findings for the other hypotheses may imply that researchers can switch from PAPI to CAPI without worrying that their change in survey mode is altering the data they collect, other research designs or environments could reveal more significant effects. Thus, we conclude this paper with a call for future research on survey mode in the developing world, suggesting what we believe are the most promising contexts and research designs for further study.

Survey Mode and Interviewer Effects

We build on a large literature examining the effects of survey mode and interviewer characteristics on survey data. The location of previous studies has typically been in the developed world and, more often than not, the United States. The survey methods literature generally
focuses on the survey modes that have been most common in the United States, including face-to-face interviewing, mail-in surveys, telephone interviewing, and online surveys. Although these studies have provided great insight into the best practices for surveys in the United States, the face-to-face interview is still the most common survey mode in the developing world. There, online surveys are rare since Internet access is often quite limited, which undermines the representativeness of Internet samples. Similarly, mail-in surveys are unusual due to unreliable mail systems and low literacy rates. Though face-to-face interviews thus are typical, the mode within this type of survey is changing, with researchers switching from pen and paper to electronic devices. Yet the potential differences between face-to-face interview modes have largely been ignored in the literature on survey methods in developing countries. This omission is surprising given that many studies comparing survey modes in the United States have revealed important differences in overall response rate, item non-response, and response distributions. Thus, it is important to understand whether those differences exist in the developing world across the various modes used there.

To inform this endeavor, we consider three ways that survey mode affects survey behavior as identified in the literature. First, survey mode affects participation rates. Of the various modes available to researchers, participation rates are always highest with face-to-face interviews (Malhotra and Krosnick 2007, 287). Telephone surveys on average have lower rates, and respondents are often more impatient with the length of interviews (Holbrook, Green and Krosnick 2003). Internet surveys that allow individuals to opt-in as panelists also have lower participation rates than face-to-face surveys (Malhotra and Krosnick 2007, 287). A number of explanations for these differences have been offered, including a lack of understanding of which incentives best increase participation in telephone and Internet

---

7Most of this literature focuses on how to ask sensitive questions (e.g., Corstange 2009; Chauchard 2013; Blair, Imai and Lyall 2014; Rosenfeld, Imai and Shapiro 2016). An exception is the literature on interviewer characteristics, which we discuss below.
surveys and structural obstacles, such as cell phone usage fees and caller ID for telephone surveys and e-mail spam filters for Internet surveys. Unfortunately in our study, we cannot assess the effect of CAPI on overall participation rates, though we suggest this is a promising research question for future work.

Second, survey mode affects item non-response and the distribution of responses to certain questions (Bowyer and Rogowski 2017). In particular, some survey modes are more susceptible to social desirability bias. Social desirability bias is the idea that individuals will refuse to respond or not respond truthfully to survey questions because they have a trait, have had an experience, or hold an opinion that is subject to social stigma or taboo. The literature on survey mode and social desirability bias is large, ranging from research on individuals’ willingness to report having taken drugs (Turner et al. 1998) or had an abortion (Jones and Forrest 1992) to their willingness to express policy opinions motivated by racial resentment (Krysan 1998). In general, more social desirability bias tends to occur when responses are shared directly with an interviewer, such as via face-to-face interviewing, and less social desirability bias tends to occur when respondents complete questionnaires themselves, such as via a self-administered pen-and-paper survey or an Internet survey. However, more recent research has found fewer differences across survey modes attributable to social desirability bias (Ansolabehere and Schaffner 2014). Nevertheless, and as we discuss below, it is important to examine how socially desirable responses vary across survey modes in other settings since this literature has generally not focused on developing countries or compared CAPI and PAPI there.

Finally, several studies look within the mode of face-to-face interviews at the effects of

---

8Researchers have also investigated other mechanisms beyond social desirability through which survey mode affects response distributions. For example, complete anonymity in Internet surveys may lead individuals to give less thoughtful responses, a survey behavior known as satisficing (Lelkes et al. 2012).
interviewer characteristics. Several characteristics are relevant. First, individual characteristics of interviewers can cause changes in reported attitudes and behaviors associated with the group identity of the interviewer. For example, interviewer race has been found to influence individuals’ reported attitudes and behaviors regarding race-related issues (e.g., Davis and Silver 2003). Interviewer gender has been shown to shape respondents’ reported views on gender issues and policies (Flores-Macias and Lawson 2008; Benstead 2013). And, Blaydes and Gillum (2013) found that interviewers wearing religious dress—specifically, headscarves in Egypt—provoked higher levels of reported religiosity in respondents under certain conditions. Second, individual characteristics of interviewers can have more wide-ranging effects on survey behavior. Adida et al. (2016) show that ethnicity matters, with respondents giving dramatically different responses to co-ethnic interviewers as opposed to non-co-ethnic interviewers. Scholars have also noted the importance of interviewer experience: More experienced interviewers can for example achieve higher overall participation rates and higher response rates to sensitive questions (Olson and Peytchev 2007).

These studies propose a variety of mechanisms to explain the interviewer effects noted above, including that interviewers’ race, gender, religion, and ethnicity encourage socially desirable responses. In particular, when an interviewer is seen as part of a certain group, respondents are primed to respond in socially desirable ways to minimize the distance between themselves and the interviewer and avoid embarrassment. This dynamic is particularly relevant for our study as we suggest that interviewers recording responses with electronic devices in developing countries may be perceived to be of higher social and economic status than interviewers recording responses with pen and paper.
The Effects of CAPI in Developing Countries

Building on the literature, we develop four hypotheses about how the use of electronic devices in face-to-face interviews could affect item non-response and response distributions. Again, we highlight two especially relevant characteristics of electronic devices in the context of developing countries. First, electronic devices are rare and high-status items. Second, electronic devices are typically able to record audio or video content discreetly. We consider the potential consequences of each characteristic in turn below.

Electronic Devices and Wealth Priming

Electronic devices signal social status in most developing countries. For example, although ownership of smart phones is increasing, the median smart phone ownership rate in “emerging and developing nations” is 37 percent according to a 2015 survey of 40 countries (Pew Research Center 2016, 5). In general, smart phone ownership is strongly correlated with national income, with quite low levels of ownership in relatively poor countries such as Tunisia (12 percent), Tanzania (11 percent), Uganda (4 percent), and Ethiopia (4 percent) (Pew Research Center 2016, 6). Moreover, there is a significant digital divide, with better educated and wealthier individuals being more likely to own a smart phone. For example, the differences in smart phone ownership rates between individuals with household incomes above and below the national median were 51 percent in Lebanon, 40 percent in Peru, and 35 percent in South Africa (Pew Research Center 2016, 11-12).

We hypothesize that the presence of a high-status electronic device during a CAPI interview in a developing country will activate social desirability effects related to income.

9The same study also indicates that variation in Internet access across and within countries—and likely thus ownership of and access to other types of electronic devices, such as laptops and tablets—is highly correlated with income.
Although survey interviewers are typically higher status than many respondents, electronic devices are an incredibly salient marker of wealth and feature prominently during interviews such that their presence may have an additive effect on perceptions of interviewer status.\textsuperscript{10} As noted above, survey respondents often try to express what they perceive as the socially desirable response to interviewers. In the social context in which face-to-face interviews take place, respondents prefer to avoid feeling embarrassed and tend to alter their responses accordingly. We therefore expect that the presence of electronic devices in a CAPI survey will raise the sensitivity of questions about household income in developing countries, particularly among the poor. The mechanism is that an interviewer with an electronic device may appear to be of a higher status than an interviewer with pen and paper, since possessing such a device suggests something about the wealth of the interviewer or her employer. Thus, in the presence of an interviewer carrying a tablet, relatively poor respondents may feel embarrassed to report their low income to the interviewer.

These social desirability dynamics have two potential effects. The first is that relatively poor respondents will be less comfortable telling their interviewer information about their economic status. In other words, poor respondents will be less likely to respond to questions related to income when they are interviewed in the presence of an electronic device.

\textit{Hypothesis 1: Relatively poor respondents will be less likely to answer questions about their household income when their interviewer uses an electronic device.}

The second potential effect is that relatively poor respondents will respond, but report higher incomes in the presence of an electronic device. The presence of an electronic device such as a smart phone or tablet makes higher incomes seem more socially desirable because that device suggests that the interviewer has a relatively high socio-economic status. To

\textsuperscript{10}Indeed, research suggests that individuals’ political attitudes and behaviors are shaped in meaningful ways even by fairly-subtle wealth cues, such as the dress and body language of the people standing nearby enumerators in public. See Sands (2017).
avoid the feelings of embarrassment that might accompany the reporting of a relatively low income in front of a relatively high-status interviewer, respondents will report a higher income than they otherwise would have.

*Hypothesis 2*: Relatively poor respondents will report higher household incomes when their interviewer uses an electronic device.

**Electronic Devices and Surveillance**

Turning to our second set of hypotheses, we first note that governments are often sponsors of public opinion surveys, including in partially democratic and authoritarian environments (Nalepa and Pop-Eleches 2013; Corstange 2015). In such contexts, governments may conduct surveys to gather information about the extent of their popular support and fine-tune their patronage strategies. The use of opinion surveys as a form of government surveillance could cause some individuals to be suspicious about these surveys and wonder what the consequences of participation will be.

Electronic devices have certain characteristics that make them particularly worrisome from the perspective of an individual concerned about whether her participation will allow the government to engage in surveillance. In the traditional method of data collection for face-to-face interviews—pen and paper—interviewers can only collect information about respondents that they are able to write down. If the interviewer does not ask the respondent identifying questions—such as name—then the respondent may feel reassured that the process is truly anonymous and confidential. In contrast, most smart phones and tablets allow interviewers to record respondents, either using audio or video, in ways that could identify them even if their names are not written down. Recording someone’s voice or image using a smart phone or tablet can often be accomplished without any obvious sign or sound. For this reason, electronic devices make surveillance via surveys easier.

We hasten to note that *actually* recording respondents in this manner is not typical in
surveys conducted by researchers in the developing world. However, in countries that are undemocratic—or that have recently transitioned from authoritarian rule—the public may be deeply suspicious of people who are conducting surveys. As such, people could be worried about the possibility of being recorded while expressing sensitive opinions. Such concerns should be especially relevant for people who oppose incumbent politicians, since they would be more likely to suffer negatively from being watched by the government.

As a consequence, we hypothesize that the surveillance prime generated by electronic devices has two potential effects. The first is that opponents of the government will be less comfortable expressing their views about the government when they are in the presence of an electronic device. The idea is that government opponents will be more worried than government supporters that their responses could be used against them. Therefore, they will be less likely to respond to questions about the government.

*Hypothesis 3:* Respondents who oppose the government will be less likely to answer questions about their support for the regime when their interviewer uses a tablet.

The second potential effect is that opponents of the government may choose to respond but falsify their response, reporting greater regime support when they are being interviewed in the presence of an electronic device. Since the presence of an electronic device during an interview makes it easier to record the respondent’s voice or image, respondents who oppose the government may report greater support than they would have otherwise if they think the government is listening. Reporting greater support for the government is also pursued according to this logic as a strategy of minimizing the risk associated with criticizing the state in a context of surveillance.

*Hypothesis 4:* Respondents who oppose the government will report greater support for the regime when their interviewer uses a tablet.
Case Selection

We test our hypotheses in Tunisia. As noted in the introduction, we exploit variation in the use of CAPI and PAPI survey methods in an otherwise-unrelated political attitudes survey. Tunisia is an interesting setting for comparing these methods for two primary reasons.

First, at the time of our study, economic issues and inequality were highly salient in Tunisia. The 2011 revolution that brought down the longtime dictator, Zine El Abidine Ben Ali, grew out of frustrations over the economy and especially perceived inequalities (Beissinger, Jamal and Mazur 2015). The revolution did not solve these economic problems, and many have worried that continued economic stagnation will undermine the fragile Tunisian democracy. Also relevant is that Tunisia is a lower-middle-income economy and, similar to other such countries, is not a context where access to tablets or smart phones is common.\footnote{United Nations Statistics Division, “Tunisia: World Statistics Pocketbook,” 2014. Available at https://data.un.org/CountryProfile.aspx?crName=TUNISIA (accessed March 17, 2017).} Although 86 percent of Tunisians reported owning a cell phone in 2014, only 12 percent reported owning smart phones or tablets, making those items relatively high-status products at the time of our study (Pew Research Center 2015, 11). With economic inequality in the spotlight and low rates of smart phone and tablet ownership, Tunisia is a plausible location for observing the wealth-priming effects of electronic devices.

Second, at the time of our study, Tunisia had recently emerged from decades of a repressive dictatorship. Many observers have highlighted the “near-comprehensive surveillance of political activities” in authoritarian Tunisia; for example, in 2002 the country had only 10.4 million citizens, but nearly 130,000 police officers (Kallander 2011). The Internet was commonly used to track political dissidents and controlled to limit negative comments about the
regime and collective action by the opposition.\textsuperscript{12} Given that the transition away from this regime only began in 2011, most of our survey participants would have experienced living in an authoritarian environment and likely associated technology with state surveillance.

Moreover, and although Tunisia had begun a democratic transition, many former regime members held political positions in the post-revolutionary government. Our study began after the first post-revolution parliamentary election, which took place in October 2014. The party Nidaa Tounes successfully won a plurality of seats in that election as well as the presidency two months later. Importantly, many of its members served in the Ben Ali government that perpetrated the surveillance state (Fakir 2014, 2). The fact that Nidaa Tounes was closely associated with the former regime meant that even though Tunisia had officially transitioned away from the surveillance state, respondents may have still been worried about being watched. Thus, Tunisia was also a plausible location for observing the surveillance-priming effects of electronic devices.

The above discussion suggests that Tunisia is a plausible case for testing hypotheses about the effects of CAPI on item non-response and response distributions. But how does Tunisia compare to other developing countries in terms of smart phone ownership and political freedom? Figure 1 plots developing countries in 2014 according to the proportion of their citizens who owned smart phones (Pew Research Center 2015) and levels of freedom.\textsuperscript{13}

On the one hand, and despite the important role that social media is thought to have played in the Tunisian revolution, Figure 1 reveals that Tunisia was among the developing countries surveyed by Pew with the lowest levels of smart phone ownership at 12 percent.\textsuperscript{12} Thus, Tunisia resembled other autocracies (King, Pan and Roberts 2013; Gunitsky 2015).

\textsuperscript{13}We averaged countries’ civil liberties and political rights scores, which range from 1 to 7. We rescaled the scores so that 1 represents the least free countries and 7 represents the most free countries. Data from Freedom House are available at https://freedomhouse.org/report-types/freedom-world (accessed March 16, 2017).
in 2014. Other countries with similar levels of smart phone ownership in the survey were Nicaragua, Kenya, Tanzania, Uganda, and Pakistan. We expect the wealth priming effects of CAPI to be relatively stronger in such environments because it is there that electronic devices are most likely to be high-status items. In contrast, we would expect wealth priming effects to be more attenuated in countries where most people own smart phones.

On the other hand, Figure 1 shows that Tunisia was among the developing countries surveyed by Pew with the most freedom in 2014, with an overall designation of “partly free.” As such, and despite the country’s authoritarian past, Tunisians may not have been as worried about state surveillance as in other developing countries. Thus, it should be considered a difficult test for Hypotheses 3 and 4. Our theory suggests that stronger surveillance effects could obtain in less free settings such as China, Egypt, Vietnam, or Uganda. At the same time, it is possible that citizens in highly repressive societies assume that all of their preferences are already known by the government, which could mean that regardless of the survey mode, respondents are primed to think about surveillance.
Research Design

We test the hypotheses using evidence from a panel survey of Tunisian political attitudes. Tunisian interviewers completed all the interviews face to face and in Arabic. We worked with one of the leading survey firms in Tunisia, ELKA Consulting, to field the survey. Although the use of electronic devices by survey firms and researchers in developing countries is increasing as discussed above, it was not commonplace in Tunisia at the time of our study. In fact, our study was the first of ELKA’s to collect data via CAPI, and among the first by any firm in the country to use CAPI.

The first wave of the survey took place after the country’s parliamentary election on October 26, 2014, and interviewed 1,400 adults. The survey sampled both male and female adult Tunisians. To create a sample that was representative of the overall population, ELKA randomly selected 100 sampling units across the country after blocking by governorate and density according to data from the most recent census at the time of the survey. Within each sampling unit, five-person teams of interviewers used a random walk method to select households to interview. Within households, interviewers used Kish tables to randomly select respondents according to age and sex. As is typical for surveys in Tunisia, interviews were not sex segregated. The response rate for the first wave of the survey was 71 percent.\textsuperscript{14}

The second wave took place following the presidential runoff election on December 21, 2014, and re-interviewed 1,107 people. Multiple attempts were made to contact people from Wave 1 in order to minimize attrition. Whenever possible, interviewers from the first wave

\textsuperscript{14}This response rate was calculated according to the AAPOR Category 1 definition, which refers to “the number of complete interviews divided by the number of interviews (complete plus partial) plus the number of non-interviews (refusal and break-off plus non-contacts plus others) plus all cases of unknown eligibility (unknown if housing unit, plus unknown, other).” See American Association for Public Opinion Research (2011, 44).
also conducted the second wave interviews.\textsuperscript{15} Even with some attrition in the second wave, the sample was representative of Tunisia as a whole on several key dimensions. Further details about the representativeness of the survey in Wave 2 are in the SI.

In Wave 1, interviewers recorded responses using PAPI. In Wave 2, the head member of each interviewer team was assigned to record responses using 7.9-inch-screen Acer tablets after training in CAPI. The other interviewers continued to use pen and paper. This design created two groups of respondents: those in the CAPI condition (i.e., with interviewers that would be given tablets in Wave 2) and those in the PAPI condition (i.e., with interviewers that would not be given tablets in Wave 2). 291 interviews in Wave 2 were completed using tablets. CAPI was introduced by ELKA to a relatively-small subset of respondents in Wave 2 as a way of gradually shifting towards the use of tablets while maintaining quality control for the broader survey project. The introduction of tablets in this manner provided a unique opportunity to study the effects of CAPI on item non-response rates and response distributions in a survey in the developing world.

We use two identification strategies. First, we use a \textit{within-subjects} design to examine whether the shift from PAPI to CAPI caused respondents to respond less often or differently to a question about household income. Because we asked the same income question in both survey waves, we can estimate the effect of CAPI independent of the effect of the interviewers who were eventually given tablets. Though we cannot be sure that the CAPI and PAPI respondents’ incomes were trending in the same direction after Wave 1, the short amount of time (two months) that elapsed between the two surveys made major changes in income unlikely. Moreover, we expect the effects of CAPI to only be present among

\textsuperscript{15}Wave 1 interviewers made the first re-contact attempt in Wave 2. Subsequent contact attempts were sometimes made by other interviewers from the same interviewer team. As the SI shows, the results are robust to dropping respondents who were not interviewed by the same interviewer in both waves.
relatively poor respondents, and there is no reason to expect that only poor respondents would display a trend towards greater incomes within two months and not the people in the other other income categories. Second, we use a between-subjects design to examine whether CAPI respondents responded less often than or differently to PAPI respondents when asked a question about government support. We examine changes between subjects in Wave 2 since we did not ask the same question about government support in both waves.

An important design consideration was how to assign the tablets to interviewers. Our primary concern was with maintaining data quality for the broader survey on political attitudes. We therefore considered the ability of interviewers to use tablets and their ability to care for and secure the devices during the interview period. These considerations led us to assign the tablets to the leader of each interviewer team, who tended to be more experienced and slightly older than the other interviewers but similar in many other ways (e.g., education level, gender, attire, region of origin within Tunisia), as discussed in more detail in the SI. Thus, our CAPI intervention can be considered a bundled “treatment” with the effects identified below resulting from the combination of CAPI and head interviewer. We believe this bundled treatment has external validity since using CAPI generally requires hiring interviewers who are able to use electronic devices successfully and responsibly. Put differently, the quantity of interest for applied survey researchers in many cases may be the combined treatment of CAPI and responsible interviewers as opposed to a “pure CAPI” treatment effect.

Although CAPI was not assigned to interviewers at random, CAPI was in expectation assigned to respondents at random since members of interviewer teams were assigned randomly to respondents in Wave 1 as discussed above. We check for balance across CAPI and PAPI interviewers in Wave 2 using measures recorded in Wave 1. In other words, we examine potential differences across respondents when all interviewers used PAPI. Doing so is particularly important for the between-subjects analysis of Hypotheses 3 and 4, whereas
Hypotheses 1 and 2 are examined using a within-subjects design.

To do so, we regress assignment to the interviewers who used tablets in Wave 2 on key individual characteristics of respondents measured in Wave 1. As Table 1 shows, the respondents interviewed by the interviewers who would use CAPI in Wave 2 did not exhibit statistically significant differences in terms of age, gender, employment status, or political interest in Wave 1. However, they did report higher incomes in Wave 1, were less likely to support Nidaa Tounes, had higher levels of education, and had lower levels of political knowledge. In the between-subjects analysis below, we control for the variables that were not well balanced during Wave 1. Importantly, as the SI shows, our findings are substantively similar if we do not control for these variables.

Results

Both waves asked, “What is your monthly family income in Tunisian dinars?” Respondents were given six answer options in keeping with the way this question is typically asked in Tunisia. Figure 2 shows the distribution of responses in Wave 1. We consider “relatively poor” respondents to be the 20 percent of respondents who reported a household income of under 200 dinars (approximately $100) in Wave 1.\(^\text{16}\) Since respondents were asked to place themselves into income “bins,” it is unlikely that any CAPI effects resulted from rounding errors or slight increases.

\(^\text{16}\) As a robustness check, we include the 42 percent of respondents in the second-lowest income category, although doing so means that we include respondents with household incomes above the median. As shown below, we find a significant effect for income in the expected direction if we restrict the sample to the poorest respondents. As the SI shows, the effect is attenuated but in the same direction when the second-lowest income category is included.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>P-Value for test that:</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAPI</td>
<td>PAPI</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>2.46</td>
<td>2.30</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>(1.085)</td>
<td>(1.022)</td>
<td></td>
</tr>
<tr>
<td>Nidaa Supporter</td>
<td>0.69</td>
<td>0.78</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>(0.462)</td>
<td>(0.417)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>39.93</td>
<td>40.22</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>(16.196)</td>
<td>(16.316)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.54</td>
<td>0.53</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>(0.500)</td>
<td>(0.500)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>3.25</td>
<td>3.01</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>(1.376)</td>
<td>(1.341)</td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>0.36</td>
<td>0.37</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>(0.482)</td>
<td>(0.482)</td>
<td></td>
</tr>
<tr>
<td>Political Interest</td>
<td>2.25</td>
<td>2.28</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>(0.942)</td>
<td>(0.947)</td>
<td></td>
</tr>
<tr>
<td>Political Knowledge</td>
<td>1.94</td>
<td>2.04</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>(0.851)</td>
<td>(0.822)</td>
<td></td>
</tr>
</tbody>
</table>

Note: All means calculated from Wave 1 measures when all interviewers used PAPI. The CAPI column reports means of respondents interviewed by interviewers who used CAPI in Wave 2. The PAPI column reports means of respondents interviewed by interviewers who used PAPI in Wave 2. Standard deviation in parentheses. P-values based on OLS regressions of variable on treatments.

Table 1: Balance tests

Hypothesis 1 was that relatively poor respondents would be less likely to respond to questions about income when their interviewer used a tablet. All but three of the poorest respondents as measured in Wave 1 reported their income in Wave 2. Thus, electronic devices did not depress response rates to an income question in Tunisia among relatively poor respondents.

Hypothesis 2 was that relatively poor respondents would report higher incomes in the presence of tablets. To test it, we use a difference-in-differences approach. Our outcome variable is reported income, measured at two points in time: Wave 1 and Wave 2. We regress income on indicators for Wave 2, interviewers given tablets in Wave 2, and their
interaction. The coefficient estimate for the interaction term is the average treatment effect and is presented in Figure 3; a table with the full results is in the SI. As it shows, the poorest respondents reported significantly higher incomes in Wave 2 in the presence of tablets. Indeed, more than half of the poorest respondents interviewed with tablets (26 out of 46) reported a higher income in Wave 2. For comparison, Figure 3 also includes other respondents, among whom tablets did not have a clear effect on reported income. As shown in the SI, our findings are similar if we regress Wave 2 income on variables indicating Wave 1 income, assignment to CAPI, and their interaction. We also find evidence of a significant interaction if we use ordered logistic regressions.

Figure 3: Effect of tablets on reported income. The coefficient estimates and 95 percent confidence intervals are from OLS regressions of income level on an indicator for assignment to the tablets in Wave 2, an indicator for Wave 2, and an interaction of the two indicators. The tablet treatment effect is given by the interaction term. The standard errors are clustered on respondent.

These differences are substantial and unlikely to be due to random response instability,
which should have been similar for CAPI and PAPI respondents. Moreover, even if respondents’ incomes—or anticipated incomes—had increased within the two months since Wave 1, such a dynamic would not explain the different patterns among CAPI and PAPI respondents. Finally, we note that the CAPI effect occurred among respondents who had already been interviewed once. Interviewers may have been able to establish some trust during Wave 1, which would have mitigated social desirability bias in Wave 2.

Next, we consider the hypotheses about the surveillance priming effects of CAPI. *Hypothesis 3* posited that respondents who opposed the regime would be less likely to answer questions about their support for the regime in the presence of tablets. *Hypothesis 4* posited that respondents would report greater support for the regime in the presence of tablets.

Because we did not ask respondents identical questions about regime support in both survey waves, we analyze variation between subjects during Wave 2. Wave 1 asked respondents, “How satisfied are you with Nidaa Tounes [the ruling party]?”. Approximately one-quarter of the respondents (261 out of 1,063) responded that they were “dissatisfied” or “very dissatisfied” with Nidaa Tounes. We code them as government opponents. Wave 2 asked a parallel question about satisfaction with the newly-elected president, Beji Caid Essebsi, also of the Nidaa Tounes party. We use responses to this question as our outcome variable.

Figure 4 presents our findings; again the tables may be found in the SI. We find no evidence that CAPI caused government opponents to respond less to a question about their satisfaction with Essebsi. Similarly, we do not find a significant effect of tablets on reported satisfaction with Essebsi among government opponents. If anything, the negative sign of the coefficient estimate suggests the opposite dynamic, though large standard errors prevent us from establishing the effect with confidence. CAPI had no clear effect on support for Essebsi among government supporters.

Did older or poorly educated respondents simply lack an understanding of the possibility of surveillance through tablets? This is a particularly important question since, as noted
Figure 4: Effect of tablets on reported satisfaction with Essebsi. Graphs report coefficient estimate and 95 percent confidence intervals. The analysis of item non-response (=1 if the individual did respond, =0 if the individual did not) uses a logistic regression. We cannot analyze item non-response for government supporters since they all responded in the CAPI group. The analysis of satisfaction with Essebsi uses ordered logistic regressions.

above, smart phones and tablets were relatively rare in Tunisia at the time of our survey. Thus, the null effect could relate to individuals’ lack of familiarity with tablets and therefore a lack of understanding of the possibility of surveillance. As the SI shows, we do not find evidence of a significant tablet effect that was conditional on age or education level. Thus, the results show that the presence of electronic devices during survey interviews did not cause opponents of the government in Tunisia to voice greater support for the regime out of fears of surveillance.

Conclusion

This study provided the first investigation of how electronic devices affect survey behavior in face-to-face interviews in the developing world. Electronic devices offer a number of important practical advantages. Yet the shift from PAPI to CAPI could bias data collection. We show that the poorest respondents in our survey reported higher incomes when interviewed using tablets than when interviewed using traditional pen-and-paper methods. However, tablets did not cause people to respond less to the income question or alter their behavior
on a question about support for the regime. Taken together, these results are mostly encouraging for researchers using CAPI. At the same time, researchers should recognize that relatively poor respondents may report higher incomes with CAPI. One implication is that income inequality may appear lower with CAPI than PAPI if wealthier respondents report the same incomes but poorer respondents report higher incomes. This finding is relevant for social scientists, governments, and development organizations that rely on longitudinal data collected via face-to-face household surveys.

Researchers can build on these findings in several ways. First, the effects of CAPI and PAPI modes can be studied in other contexts. For example, surveillance-priming effects of CAPI could emerge more clearly in less democratic contexts or where surveillance is ongoing and salient. Second, researchers can explore whether CAPI affects individuals’ decisions to participate in surveys in the first place. Larger CAPI effects in terms of item non-response and response distributions could also emerge if researchers introduce tablets during initial contact with potential interviewees rather than at second contact as in our study. Third, scholars could develop and test hypotheses about how CAPI affects other types of survey responses beyond those pertaining to income and government satisfaction. Fourth, scholars could include follow-up questions in surveys to more directly test the hypothesized mechanisms of social desirability bias and concerns about surveillance via electronic devices. Fifth, in future surveys, CAPI devices may be assigned randomly to survey enumerators to disentangle to bundled treatment of CAPI and experienced interviewers that we present in this study, though we recommend extensive training for less-experienced interviewers.

Finally, we build on other researchers’ experiences with CAPI to offer several practical recommendations (Benstead et al. 2017). First, providing details about survey mode should become standard practice. Alongside more commonly-reported details such as sampling methods and response rates, researchers should report whether their survey was conducted in person and, if so, how responses were recorded. Second, researchers conducting longi-
tudinal surveys might switch gradually from PAPI to CAPI, using random assignment of CAPI when possible to assess any biases that electronic devices are introducing. Finally, researchers should do what they can to reduce the potential biases introduced by electronic devices. For example, a wealth-priming effect associated with tablets might be mitigated by using electronic devices that do not appear to be too expensive or by using objective measures of income (e.g., characteristics of the respondent’s home). Although there is no magic bullet for dealing with social desirability biases, researchers have an extensive literature on questionnaire design on which they can rely to develop solutions.
Funding and Human Subjects Approval

This work was supported by the National Science Foundation under Grant No. 1456505. Any opinions, findings, conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation. This research received clearance from the Temple University Institutional Review Board via Protocol 22385 and the Stanford University Institutional Review Board via Protocol 31932 (International Election Observation and Perceptions of Election Credibility: A Case Study in the Arab World).
References


**URL:** [http://www.merip.org/mero/mero012611](http://www.merip.org/mero/mero012611)


Supporting Information

This appendix contains information that is supplemental to “How Electronic Devices in Face-to-Face Interviews Change Survey Behavior: Evidence from a Developing Country.”

Contents

1 Survey on Current Survey Practices in the Developing World 2

2 Wave 2 Sample Composition 4

3 Interviewers and Balance 5

4 Further Analyses of Reported Income, Wave 2 8
   4.1 Regression Table for Main Results 8
   4.2 Different Coding of Poorest Respondents 9
   4.3 Respondents Interviewed by Same Person in Both Waves 10
   4.4 Interaction between Wave 1 Income and Tablets 11

5 Further Analyses of Reported Satisfaction with Essebsi, Wave 2 13
   5.1 Regression Table for Main Results 13
   5.2 No Controls 14
   5.3 Interaction with Age 15
   5.4 Interaction with Education 16

6 Survey Questions 17
   6.1 Wave 1 Questions 17
   6.2 Wave 2 19
1 Survey on Current Survey Practices in the Developing World

To understand current practices with regards to survey mode in the developing world, we conducted an online survey of political scientists in March 2017. A link to the anonymous survey was provided via the POLMETH listserv and social media. Anyone who had conducted at least one survey in a developing country in the past five years was invited to participate.

76 individuals took the survey. The sample included responses from survey researchers working in every region of the developing world (broadly construed). Specifically, respondents indicated having recently conducted surveys in East Asia, Eastern Europe and Central Asia, Latin America, the Middle East and North Africa, South Asia, and sub-Saharan Africa.

As expected, face-to-face interviews were the predominant interview mode in the respondents’ surveys. As Table 1 shows, 84 percent of the respondents’ most recent surveys used face-to-face methods as one of their interview modes or their only interview mode. Some surveys also used phone or Internet technology to collect data, but these modalities were the exception to the rule.

<table>
<thead>
<tr>
<th>Interview Mode</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face to face</td>
<td>84</td>
</tr>
<tr>
<td>Telephone or SMS</td>
<td>11</td>
</tr>
<tr>
<td>Internet</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 1: Common Interview Modes in the Developing World. Note that respondents could select more than one survey mode in this question.

Within interviews conducted using face-to-face methods, respondents were split between computer-assisted personal interviewing (CAPI) and paper-assisted personal interviewing (PAPI). As Table 2 shows, 27 percent of respondents used CAPI methods exclusively, and an additional 25 percent used CAPI methods in combination with PAPI methods. In other words, a total of just over half of the projects reported in our survey involved electronic devices in some way. Given the recent availability of CAPI technology, this pattern represents a marked change in the way that survey research has been conducted over the past decade.

As we expected, the most common reason given for why the researcher chose CAPI or PAPI was that she was following the common practice in the location(s) where the survey was conducted.
conducted. In addition, common reasons for why researchers did not opt for CAPI included that it is expensive and/or difficult to use and that electronic devices make interviewers targets for violence. Common reasons for why researchers did use CAPI included that it facilitates complex questionnaires and randomization, allows for faster data transmission, and allows for better monitoring of interviewers. Interestingly, when respondents who used PAPI exclusively were invited to write in reasons for why they did not use electronic devices, one individual wrote that electronic devices “generate additional social desirability bias because they are so rare.”

<table>
<thead>
<tr>
<th>Interview Mode</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pen and paper</td>
<td>48</td>
</tr>
<tr>
<td>Electronic devices</td>
<td>27</td>
</tr>
<tr>
<td>Both</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 2: **Common Interview Modes in the Developing World.**
2 Wave 2 Sample Composition

Several comparisons between the survey sample and the overall Tunisian population suggest that the goal of a nationally-representative sample was achieved. We focus on several key dimensions using the closest available annual data from the CIA World Factbook and, in the case of the runoff data, our other research.¹

- Median age: Survey = 37; Country = 32
- Unemployment rate: Survey = 17; Country = 15
- Proportion urban: Survey = 68; Country = 67
- Sex ratio: Survey = 0.89; Country = 0.99
- Essebsi voters in presidential runoff election: Survey = 59%; Country = 56%

Though of course there are some small differences between our survey sample and the Tunisian population, we conclude from these comparisons that our survey interviewers successfully sampled the country as a whole.

3 Interviewers and Balance

Five-person teams of interviewers conducted the interviews face-to-face as described in the previous SI section. Within each team, tablets were assigned in Wave 2 to the senior interviewer on each team (i.e., the person with the most experience working with ELKA), who was responsible for gathering questionnaires at the end of each day as well as conducting interviews him- or herself.

We decided to distribute the tablets to the senior interviewers in consultation with ELKA Consulting (our local partner) primarily to promote data quality. Because using tablets in the context of face-to-face surveys was novel in Tunisia at the time of our survey, it was important for the tablets to be taken into the field by the most experienced and responsible team members. Although Tunisia is not an extremely poor country, many of the interviewers working with our survey did not have much experience using tablets. Using tablets might also be viewed as a perk and raised some concerns about loss or theft, which were also factors that encouraged giving them to the head interviewers.

As noted in the main text, the non-random assignment of tablets to interviewers is a limitation of our study’s design, as the interviewers with the tablets were generally older than the other interviewers in our study on average. As such, the significant CAPI effects we identify related to income reporting may be best understood as resulting from the combination of CAPI and senior interviewers. It is conceivable that significant results might not have obtained with different interviewers, and it would be fruitful for future studies to attempt to separate CAPI effects from interviewer effects. That said, we suspect in the real world that the “CAPI treatment” is (and perhaps even must) be bundled with a similar “responsible enumerator” treatment, since researchers must hire interviewers who can successfully use CAPI so that they can be confident about their data quality.

Moreover, CAPI interviewers were similar to PAPI interviewers on several relevant dimensions. For an example of an interviewer team, see the five individuals pictured in Figure 1 below; the “senior” interviewer on the team is the man wearing the red shirt, who was a bit

---

2 Recall that we also provided training on CAPI for these interviewers.

3 Ideally, we could use information about enumerators to match CAPI and PAPI interviewers in terms of age, income, number of previous surveys completed, and the like to separate the effect of CAPI from the effect of senior interviewers. Unfortunately, we are not able to do that due to a lack of such information about the CAPI interviewers. As such, we consider the similarities between CAPI and PAPI interviewers in terms of the characteristics on which we do have information, rely on the within-subjects (and within-interviewer) design for the income analysis, and use balance tests to assess the need to control for other variables in the between-subjects surveillance analysis.
older than the other interviewers but otherwise similar in appearance. First, all interviewer teams were comprised of interviewers who hailed from the regions in Tunisia where they conducted their interviews. Second, all interviewers were university students or graduates with prior survey experience. Third, all interviewers wore business casual clothing and carried ELKA Consulting badges and clipboards. It is therefore possible that interviewers’ high levels of educational attainment and professionalism could have accentuated the potential for social desirability biases related to wealth. Fourth, men and women were equally likely to be in the role of senior interviewer. Specifically, women represented 55 percent of the tablet interviewers and 52 percent of the non-tablet interviewers. Fifth, all interviewers (both CAPI and PAPI) participated in a multi-day training and pilot experience before beginning the survey. Finally, few interviewers wore Muslim religious dress. As such, it is possible that interviewers could have been viewed by respondents as being relatively secular, which could have accentuated the potential for concerns about surveillance by the secular government, though we did not find such effects.
Figure 1: Members of an interviewer team.
4 Further Analyses of Reported Income, Wave 2

4.1 Regression Table for Main Results

<table>
<thead>
<tr>
<th></th>
<th>Model 1 (Poorest Rs)</th>
<th>Model 2 (All Other Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet Interviewer</td>
<td>0.00</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.072)</td>
</tr>
<tr>
<td>Second Wave</td>
<td>0.41</td>
<td>-0.09</td>
</tr>
<tr>
<td></td>
<td>(0.050)</td>
<td>(0.032)</td>
</tr>
<tr>
<td>Second Wave x Tablets</td>
<td>0.31</td>
<td>-0.05</td>
</tr>
<tr>
<td></td>
<td>(0.139)</td>
<td>(0.067)</td>
</tr>
<tr>
<td>N</td>
<td>205</td>
<td>828</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.22</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Table 3: The Effects of Tablets on Reported Income, Difference-in-Differences Analysis. The sample for Model 1 is restricted to respondents reporting only the lowest level of income in Wave 1. The coefficient on Tablet Interviewer is therefore 0 in Model 1 as there is no variation in the first wave on reported income. The sample for Model 2 is respondents reporting all other income levels. This table gives the results from ordinary least squares regressions with standard errors clustered on the respondent.
4.2 Different Coding of Poorest Respondents

In our main analysis (and the previous table), we consider “relatively poor” respondents to be the 20 percent of respondents who reported a household income of under 200 dinars (approximately $100) in Wave 1. As a robustness check, we also include here the 42 percent of respondents in the second lowest income category, although doing so means that we are then including respondents with a household income that is above the median and thus are examining quite a heterogeneous group of respondents. As shown below, the CAPI effect is attenuated but in the same direction when the second lowest income category is included.

<table>
<thead>
<tr>
<th></th>
<th>Model 1 (Relatively Poor Rs)</th>
<th>Model 2 (All Other Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet Interviewer</td>
<td>0.01 (0.043)</td>
<td>0.06 (0.088)</td>
</tr>
<tr>
<td>Second Wave</td>
<td>0.15 (0.030)</td>
<td>-0.24 (0.055)</td>
</tr>
<tr>
<td>Second Wave x Tablets</td>
<td>0.11 (0.069)</td>
<td>-0.07 (0.110)</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>641</td>
<td>392</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
<td>0.03</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table 4: The Effects of Tablets on Reported Income, Difference-in-Differences Analysis. The sample for Model 1 is restricted to respondents reporting the lowest two levels of income in Wave 1. The sample for Model 2 is respondents reporting all other income levels. This table gives the results from ordinary least squares regressions with standard errors clustered on the respondent.
### 4.3 Respondents Interviewed by Same Person in Both Waves

<table>
<thead>
<tr>
<th></th>
<th>Model 1 (Poorest Rs)</th>
<th>Model 2 (All Other Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tablet Interviewer</strong></td>
<td>0.00</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.092)</td>
</tr>
<tr>
<td><strong>Second Wave</strong></td>
<td>0.32</td>
<td>-0.08</td>
</tr>
<tr>
<td></td>
<td>(0.054)</td>
<td>(0.040)</td>
</tr>
<tr>
<td><strong>Second Wave x Tablets</strong></td>
<td>0.35</td>
<td>-0.18</td>
</tr>
<tr>
<td></td>
<td>(0.152)</td>
<td>(0.094)</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>120</td>
<td>442</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
<td>0.23</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Table 5: **The Effects of Tablets on Reported Income, Difference-in-Differences Analysis.** The sample for Model 1 is restricted to respondents reporting only the lowest level of income in Wave 1. The coefficient on *Tablet Interviewer* is therefore 0 in Model 1 as there is no variation in the first wave on reported income. The sample for Model 2 is respondents reporting all other income levels. This table gives the results from ordinary least squares regressions with standard errors clustered on the respondent.
4.4 Interaction between Wave 1 Income and Tablets

The following table and graph report the results from a regression of Wave 2 income on variables indicating Wave 1 income, assignment to the CAPI condition, and their interaction. Since this analysis relies on a comparison between subjects in Wave 2, we include the control variables suggested by our balance tests, described above. Please note that we combine the upper three income categories in this analysis – 1001-1500 dts, 1501-2500 dts, and >2501 dts – because of the small number of respondents in these upper income categories, which combined represent only about 10 percent of our sample.

![Graph showing the effect of CAPI on reported income, conditional on reported income in Wave 1. Predictions based on Model 1 in Table 6.](image)

Figure 2: The Effect of CAPI on Reported Income, Conditional on Reported Income in Wave 1. Predictions based on Model 1 in Table 6.
<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet Interviewer</td>
<td>0.27 (0.124)</td>
</tr>
<tr>
<td>Income: 201-500 dt</td>
<td>0.60 (0.073)</td>
</tr>
<tr>
<td>Income: 501-1000 dt</td>
<td>2.37 (0.084)</td>
</tr>
<tr>
<td>Income: &gt;1001 dt</td>
<td>2.34 (0.112)</td>
</tr>
<tr>
<td>Tablet*201-500 dt</td>
<td>-0.26 (0.150)</td>
</tr>
<tr>
<td>Tablet*501-1000 dt</td>
<td>-0.27 (0.160)</td>
</tr>
<tr>
<td>Tablet*&gt;1001 dt</td>
<td>-0.38 (0.200)</td>
</tr>
<tr>
<td>Age</td>
<td>0.00 (0.002)</td>
</tr>
<tr>
<td>Sex</td>
<td>-0.12 (0.048)</td>
</tr>
<tr>
<td>Education</td>
<td>0.10 (0.023)</td>
</tr>
<tr>
<td>N</td>
<td>993</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Table 6: The Effect of CAPI on Reported Income, Conditional on Reported Income in Wave 1. The sample for Model 1 is all respondents. The baseline category for “Income” is <200 dts. This table gives the results from ordinary least squares regressions with standard errors clustered on the respondent.
5 Further Analyses of Reported Satisfaction with Essebsi, Wave 2

5.1 Regression Table for Main Results

<table>
<thead>
<tr>
<th></th>
<th>Model 1 (Item Non-Response)</th>
<th>Model 2 (Response)</th>
<th>Model 3 (Response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet</td>
<td>0.21 (0.613)</td>
<td>-0.34 (0.262)</td>
<td>-0.05 (0.169)</td>
</tr>
<tr>
<td>Income</td>
<td>-0.15 (0.262)</td>
<td>0.05 (0.126)</td>
<td>-0.15 (0.081)</td>
</tr>
<tr>
<td>Political Knowledge</td>
<td>0.05 (0.364)</td>
<td>-0.01 (0.158)</td>
<td>0.07 (0.095)</td>
</tr>
<tr>
<td>Education</td>
<td>0.13 (0.234)</td>
<td>-0.15 (0.104)</td>
<td>-0.23 (0.061)</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.61 (1.116)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov. Opposition?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>N</td>
<td>246</td>
<td>232</td>
<td>740</td>
</tr>
</tbody>
</table>

Table 7: The Effects of Tablets on Reported Satisfaction with Essebsi. The samples for Models 1 and 2 are government opponents. The sample in Model 3 is government supporters. We were not able to analyze item non-response for government supporters as there were no non-responses for government supporters interviewed via tablet. All covariates measured in wave one. Outcome measured in wave two. Model 1 presents results from a logistic regression. The dependent variable in Model 1 is coded 1 for answering the question and 0 corresponds to refusal. Models 2 and 3 present results from ordinal logistic regressions with higher values corresponding to greater satisfaction with Essebsi.
## 5.2 No Controls

<table>
<thead>
<tr>
<th></th>
<th>Model 1 (Item Non-Response)</th>
<th>Model 2 (Response)</th>
<th>Model 3 (Response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet</td>
<td>0.39</td>
<td>-0.27</td>
<td>-0.08</td>
</tr>
<tr>
<td></td>
<td>(0.593)</td>
<td>(0.253)</td>
<td>(0.160)</td>
</tr>
<tr>
<td>Constant</td>
<td>2.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.299)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov. Opposition?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>N</td>
<td>261</td>
<td>245</td>
<td>773</td>
</tr>
</tbody>
</table>

Table 8: **The Effects of Tablets on Reported Satisfaction with Essebsi.** The samples for Models 1 and 2 are government opponents. The sample in Model 3 is government supporters. We were not able to analyze item non-response for government supporters as there were no non-responses for government supporters interviewed via tablet. All covariates measured in wave one. Outcome measured in wave two. Model 1 presents results from a logistic regression. The dependent variable in Model 1 is coded 1 for answering the question and 0 corresponds to refusal. Models 2 and 3 present results from ordinal logistic regressions with higher values corresponding to greater satisfaction with Essebsi.
5.3 Interaction with Age

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Item Non-Response)</td>
<td>(Response)</td>
<td>(Response)</td>
</tr>
<tr>
<td>Tablet</td>
<td>0.33</td>
<td>-0.11</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>(0.866)</td>
<td>(0.407)</td>
<td>(0.221)</td>
</tr>
<tr>
<td>&lt; 35 yrs</td>
<td>0.32</td>
<td>-0.05</td>
<td>-0.19</td>
</tr>
<tr>
<td></td>
<td>(0.685)</td>
<td>(0.326)</td>
<td>(0.187)</td>
</tr>
<tr>
<td>Tablet*&lt; 35 yrs</td>
<td>-0.02</td>
<td>-0.33</td>
<td>-0.23</td>
</tr>
<tr>
<td></td>
<td>(1.210)</td>
<td>(0.536)</td>
<td>(0.338)</td>
</tr>
<tr>
<td>Education</td>
<td>0.03</td>
<td>-0.02</td>
<td>-0.19</td>
</tr>
<tr>
<td></td>
<td>(0.250)</td>
<td>(0.114)</td>
<td>(0.068)</td>
</tr>
<tr>
<td>Income</td>
<td>0.06</td>
<td>-0.11</td>
<td>-0.15</td>
</tr>
<tr>
<td></td>
<td>(0.260)</td>
<td>(0.113)</td>
<td>(0.081)</td>
</tr>
<tr>
<td>Political Knowledge</td>
<td>0.05</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>(0.361)</td>
<td>(0.162)</td>
<td>(0.096)</td>
</tr>
<tr>
<td>Constant</td>
<td>2.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.486)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov. Opposition?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>N</td>
<td>246</td>
<td>231</td>
<td>741</td>
</tr>
</tbody>
</table>

Table 9: The Effects of Tablets on Reported Satisfaction with Essebsi by Age. The samples for Models 1 and 2 are government opponents. The sample in Model 3 is government supporters. We were not able to analyze item non-response for government supporters as there were no non-responses for government supporters interviewed via tablet. All covariates measured in wave one. Outcome measured in wave two. Model 1 presents results from a logistic regression. The dependent variable in Model 1 is coded 1 for answering the question and 0 corresponds to refusal. Models 2 and 3 present results from ordinal logistic regressions with higher values corresponding to greater satisfaction with Essebsi.
## 5.4 Interaction with Education

<table>
<thead>
<tr>
<th></th>
<th>Model 1 (Item Non-Response)</th>
<th>Model 2 (Response)</th>
<th>Model 3 (Response)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet</td>
<td>0.23</td>
<td>-0.37</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>(0.699)</td>
<td>(0.315)</td>
<td>(0.190)</td>
</tr>
<tr>
<td>College Degree</td>
<td>0.03</td>
<td>-0.25</td>
<td>-0.74</td>
</tr>
<tr>
<td></td>
<td>(0.728)</td>
<td>(0.331)</td>
<td>(0.229)</td>
</tr>
<tr>
<td>Tablet*College Degree</td>
<td>0.27</td>
<td>0.28</td>
<td>-0.17</td>
</tr>
<tr>
<td></td>
<td>(1.388)</td>
<td>(0.565)</td>
<td>(0.404)</td>
</tr>
<tr>
<td>Income</td>
<td>0.06</td>
<td>-0.10</td>
<td>-0.17</td>
</tr>
<tr>
<td></td>
<td>(0.256)</td>
<td>(0.112)</td>
<td>(0.078)</td>
</tr>
<tr>
<td>Political Knowledge</td>
<td>0.05</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>(0.352)</td>
<td>(0.158)</td>
<td>(0.094)</td>
</tr>
<tr>
<td>Constant</td>
<td>2.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.031)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10: **The Effects of Tablets on Reported Satisfaction with Essebsi by Education Level.** The samples for Models 1 and 2 are government opponents. The sample in Model 3 is government supporters. We were not able to analyze item non-response for government supporters as there were no non-responses for government supporters interviewed via tablet. All covariates measured in wave one. Outcome measured in wave two. Model 1 presents results from a logistic regression. The dependent variable in Model 1 is coded 1 for answering the question and 0 corresponds to refusal. Models 2 and 3 present results from ordinal logistic regressions with higher values corresponding to greater satisfaction with Essebsi.
6 Survey Questions

Below, we provide the text in English for the questions that are referenced in the main text or earlier in the SI. Please note that these questions were embedded in a larger survey of political attitudes in Tunisia.

6.1 Wave 1 Questions

1. In general, to what extent are you interested in politics?
   (a) Not interested
   (b) Slightly interested
   (c) Interested
   (d) Very interested

2. At the last election, we noticed that a lot of people weren’t able to vote for various reasons. Did you vote in the recent election?
   (a) No
   (b) Yes

3. How satisfied are you with Nidaa Tounes?
   (a) Very satisfied
   (b) Satisfied
   (c) Dissatisfied
   (d) Very dissatisfied

4. Now, I am going to ask you three factual questions about politics in Tunisia. Even if you aren’t sure, please give me your best guess. First, do you know what was the name of the Prime Minister going into the recent election?
   (a) Ali Laarayedh  

---

4Responses to these questions were combined to create the political knowledge variable. Each accurate response was coded as “1,” whereas each inaccurate response was coded as “0.” Accordingly, the political knowledge variable ranges from 0 to 3.
(b) Mehdi Jomaa
(c) Hamadi Jebali

5. Second, do you know for how many years will the Chamber of the People’s Deputies be elected?
   (a) Three
   (b) Four
   (c) Five

6. Third, do you know what percent of parties lists are reserved for women?
   (a) 50
   (b) 33
   (c) 25

7. Finally, I’d like to ask you some background questions. How old are you?

8. (Fill in gender of the respondent.)
   (a) Male
   (b) Female

9. What is the highest level of education that you have received?
   (a) Illiterate
   (b) Elementary
   (c) Primary
   (d) Secondary
   (e) Undergraduate (B.A.)
   (f) M.A. or higher

10. Are you currently employed?
   (a) No
    (b) Yes
11. What is your monthly family income in Tunisian dinars (dt)?
   (a) Less than 200 dt
   (b) 200-500 dt
   (c) 501-1000 dt
   (d) 1001-1500 dt
   (e) 1501-2500 dt
   (f) More than 2501 dt

12. (Fill in location of the household.)
   (a) Urban
   (b) Rural

6.2 Wave 2

1. Did you vote in the runoff presidential election?
   (a) No
   (b) Yes

2. How satisfied are you with Beji Caid Essebsi?
   (a) Very satisfied
   (b) Satisfied
   (c) Dissatisfied
   (d) Very dissatisfied

3. What is your monthly family income in Tunisian dinars (dt)?
   (a) Less than 200 dt
   (b) 200-500 dt
   (c) 501-1000 dt
   (d) 1001-1500 dt
   (e) 1501-2500 dt
   (f) More than 2501 dt