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PASSAUER DISKUSSIONSPAPIERE

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On the malleability of gender attitudes: Evidence from implicit and explicit measures in Tunisia

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Abstract: We use an implicit association test (IAT) next to a set of direct survey questions to measure implicit and explicit gender attitudes in Tunisia. Tunisia is among the most advanced countries in the Arab region in terms of women rights and legal reforms that shall strengthen the position of women. Yet, there still exists a tension between the law and what is practiced. We examine the malleability of these attitudes using (i) a randomized video intervention and (ii) natural variation in interviewer characteristics with respect to gender and perceived religiosity. The video has no average impact, which is consistent with the idea that in a highly polarized society like Tunisia such an intervention only affects attitudes of specific groups in a society. We indeed find that the video mitigates the implicit gender bias only among a specific subpopulation: conservative women. We also confirm the presence of interviewer effects, both for implicit and explicit attitudes. These effects are more pronounced for explicit attitudes, which may suggest social desirability at work. We discuss the implications of our findings for further research and policies targeted at gender attitudes.

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1 Introduction

Women's empowerment has become a top priority on national and global development agendas in recent years (European Commission, 2015; UN Women, 2011). Although it is a worthy goal on its own, there is also an extensive literature demonstrating a strong two-way link between female empowerment and economic development (Ashraf, Karlan, & Yin, 2010; Cuberes & Teignier, 2014; Duflo, 2012; Duflo & Udry, 2004). In many regions, significant parts of society are nevertheless unsupportive of women's empowerment. In such contexts the role of women is still often defined by religious norms and traditions with pervasive stereotypes towards women's ability to take decisions (Duflo, 2012; Klasen & Lamanna, 2009). Such gender norms persist even when economic conditions change (Field, Jayachandran, & Pande, 2010; Luke & Munshi, 2011; Munshi & Rosenzweig, 2006). Even women report in some cases to be less progressive than men possibly due to practical or security concerns (Yount, Halim, Schuler, & Head, 2013; Yount & Li, 2009, 2010). An increasing number of policy interventions aims to change the apparent persistence of unequal gender norms and attitudes. Yet, to empirically test the effectiveness of such interventions, reliable data on gender norms and attitudes is needed. Data quality however strongly defines its potential and surveys typically largely rely on self-reported answers to questions related to gender attitudes (Kågesten et al., 2016; Pulerwitz & Barker, 2008; Raj et al., 2016). While we routinely accept self-reports for unambiguous questions such as the number of siblings or bike ownership, measuring gender attitudes is arguably more complex. Gender attitudes are an abstract concept and as such more prone to measurement error due to erroneous interpretations. Moreover, this is often sensitive, and respondents may not feel comfortable stating the truth if they believe this portrays an unfavorable image of themselves in view of existing laws or prescribed social norms. We therefore need other (complementary) methods that help us take stock of gender attitudes and examine their malleability in response to policies and interventions that may be conducive to change prevailing social norms and behavior in favor of female empowerment. Our study gets at exactly these two issues. Specifically, we rely on a new field application of an implicit association test (IAT) (see Greenwald, Nosek, & Banaji, 2003; Greenwald, Poehlman, Uhlmann, & Banaji, 2009; Kim, 2006) as a complementary measurement tool to direct survey questions. IATs are often used in lab experiments to measure implicit attitudes, which are believed to be outcomes of an indirect automatic evaluative process, and less prone to issues of social desirability (Petty, Fazio, & Briñol, 2012). We apply the IAT to assess gender attitudes in the field and in response to a brief intervention.

We use a short video intervention to examine changes in implicit attitudes as measured through our IAT. Our video shows real-life gender reforms affecting Tunisian society and may therefore induce a change in the mindset of respondents through various channels. The intervention is brief and "light-touch" and thus different from well-known policy interventions that aim to change gender attitudes through intensive training and educational initiatives for both

men and women in traditional societies (e.g., Beaman, Duflo, Pande, & Topalova, 2012; Raj et al., 2016; WHO, 2009). Our study is therefore more closely linked to evidence from Western societies that show how even short educational programs reduce people's implicit gender bias and promote female hiring in academic leadership positions (e.g., Carnes et al., 2012; Girod et al., 2016). Another study to which our intervention compares, is the one by Banerjee and Gupta (2015), who use a 30-minute video to reduce caste-related prejudice among Indian students. It also relates to findings from controlled laboratory settings, which show that implicit measures may change in response to short primes like strengthening or weakening associations (e.g., counter-stereotypical admired individuals), or setting goals to weaken or strengthen bias (e.g., by making antiprejudice norms salient) (Blair, 2002; Dasgupta & Asgari, 2004; Dasgupta & Greenwald, 2001; Ferguson, 2008; Ferguson & Bargh, 2004; Horcajo, Briñol, & Petty, 2010; Todd, Bodenhausen, Richeson, & Galinsky, 2011).

Moreover, we exploit natural variation in interviewer traits to investigate changes in implicit attitudes (i.e., IAT D-scores) and contrast this with responses from explicit attitudes (i.e., direct survey responses). We look at two interviewer traits we deem particularly relevant for our setting: gender and perceived religiosity. We analyze whether implicit attitudes not only differ in response to very short treatments, but also in response to who is conducting the treatment and (or) survey, and challenge the common assumption that implicit attitudes reflect highly stable mental representations stemming from long-term socialization processes (Petty, Briñol, Tormala, Blair, & Jarvis, 2006; Wilson, Lindsay, & Schooler, 2000).

We conduct our study in Tunisia, a country that is among the most advanced in the Arab region in terms of women rights and legal reforms that shall strengthen the position of women. Yet, there still exists a tension between the law and what is practiced. In Tunisia the role of women is still to a large extent defined by conservative norms and pervasive stereotypes (Chambers & Cummings, 2014).

Our results are as follows. Short primes in the form of a randomized video treatment reduce the implicit gender bias, but only for very conservative women. We believe that the video treatment may have had more informational value for these women that operate in tight social networks characterized by conservative gender norms vis-à-vis women surrounded by progressive network members. We also observe the presence of interviewer effects both among implicit and explicit attitudes. However, impacts differ by groups and attitudes measure. Female interviewers lead to more conservative implicit attitudes, though only for males. Having a female interviewer might work as an unintended prime, reflecting a counter-stereotypical or maybe even provocative image of women, that affects men more than women. Female interviewers and religious dress both affect explicit attitudes for men and women. Our results support limited but emerging evidence on the malleability of implicit attitudes in response to very brief external interventions and interviewer characteristics (e.g., Banerjee & Gupta, 2015; Dasgupta & Asgari, 2004). Also, comparing interviewer effects on implicit and explicit attitudes shows that our results are consistent with the idea that explicit attitudes are increasingly susceptible to some form of social

desirability bias if questions become more sensitive.

The remainder of the paper is structured as follows. In Section 2, we present a short conceptual framework that describes how the video and interviewer traits may affect gender attitudes. Section 3 introduces the study context and explains how we conducted the IAT. This section also describes the randomization and implementation of the video treatment, how we measure explicit attitudes in addition to implicit ones, and how we assess interviewer effects. In Section 4 we lay out our empirical strategy. Section 5 presents our results and Section 6 ends with a brief discussion of the results and a conclusion.

2 Conceptual framework

The randomized intervention is a short video, portraying women in Tunisia in non-stereotypical roles, and providing information on present and future legal reforms to promote gender equality. Our video intervention represents gender reforms affecting Tunisian society today and has three interrelated aims: (i) to provide people with information about these achieved reforms, (ii) to set goals with respect to female empowerment, and (iii) to be conducive to weakening gender stereotypes. A video promoting gender equality conceptually relates to other training and educational interventions discussed above that try to alter implicit gender attitudes and ultimately, behavior (e.g., Carnes et al., 2012; Girod et al., 2016).[1] A video like ours may work similarly and make individuals aware of (legal) alternatives to gender inequality within and outside of the household, thereby reducing their implicit gender bias. Yet, at the same time such a video may act as a provocation and threat to the common dominant position of men in patriarchal societies as Tunisia and induce a "backlash effect" (e.g., Luke & Munshi, 2011), thereby reducing support for female empowerment. Given that both phenomena plausibly exist, the aggregate net effect of interventions like ours may well be zero and argues for a careful disaggregation of results.

Interviewer effects are possibly even more difficult to predict in our context than the impact of the video. While studies in the US show that respondents provide more progressive and egalitarian answers on gender-sensitive questions when interviewed by women (e.g., Huddy et al., 1997; Kane & Macaulay, 1993), Benstead (2013) finds that only men report more egalitarian views to female interviewers in a study in Morocco. This suggests that context matters and that interviewer effects might be asymmetric (Flores-Macias & Lawson, 2008). Also, female interviewers may represent a counter-stereotypical image. Independent women having a qualified job may serve as role models, or conversely as a threat to existing cultural norms, especially in a context where male unemployment rates are exceptionally high. For perceived religiosity the evidence base is small with only three studies (Morocco, Egypt and Tunisia), with all of them showing that respondents answer more in line with perceived religious norms if interviewed by a

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[1]This, however, does not mean that such primes always work in favor of female empowerment. Rudman and Phelan (2010), for example, find that presenting women in male-dominated careers in fact reduces other women's interest in choosing a masculine occupation.

woman wearing a hijab (Benstead, 2014; Blaydes & Gillum, 2013; Mneimneh, De Jong, Cibelli Hibben, & Moaddel, 2018). However, none of the studies investigates interviewer effects in the context of implicit gender attitudes in addition to explicit, direct self-reports.[2]

To summarize, implicit gender attitudes seem malleable in response to brief targeted interventions in Western societies and controlled laboratory settings. Also, subtle cues like gender and perceived religiosity of the interviewer appear to affect gender attitudes, at least when measured explicitly. Yet, this leaves a number of empirical questions unanswered: first, (how) does a short intervention affect implicit attitudes when tested in a development country field setting? Second, do we observe differential impacts when results are disaggregated by specific groups? And third, are interviewer traits capable of affecting implicit attitudes in addition to explicit ones? This paper addresses these questions in the context of Tunisia.

3 Study context and implementation of the IAT

3.1 A representative survey

We conducted a nationwide representative socio-economic survey among 1,150 households in Tunisia in October and November 2017. The survey was part of a larger research project with the purpose to take stock of levels of women's and youth empowerment across the country.[3] We selected households based on a stratified random sampling method, with stratification at the highest (governorate), medium (delegations), and lowest administrative unit (sectors). We selected 115 sectors, of which 48 were rural and the remaining 67 were urban. Per sector we randomly selected ten households. Within each household we interviewed up to four adult individuals (older than 18 years of age). The survey, video intervention and IAT were conducted inside the respondents' house. For the surveys, the enumerators worked with tablet computers, whereas the video and IAT were done using small Windows notebooks. We obtained written informed consent from each survey participant. The survey covers standard demographic and socio-economic questions in addition to modules related to dimensions of women's empowerment, including self-reported attitudes towards gender inequality and domestic violence. We use these data to explore explicit attitudes, to verify balance in our treatment and control groups, to increase the precision of our estimates in a regression framework, and to assess impact heterogeneity. We applied the IAT after completion of the survey with a randomly selected sub-sample of households. Within each selected household, all respondents were invited to participate in

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[2]We are only aware of one, which is the study by Lowes, Nunn, Robinson, and Weigel (2015), who conduct an IAT next to explicit survey questions among a population of Congolese participants to investigate own ethnicity bias. They find that such bias exists in both explicit and implicit measures and that interviewer characteristics (here the ethnicity of the enumerator) matter too, but only for explicit measures: participants self-report more positive attitudes of an ethnic group when the enumerator belongs to that ethnic group.

[3]The results of the project are described in Ghali et al. (2018).

the IAT. 460 respondents completed the IAT, but we have IAT and survey data for a slightly smaller number of 399 observations.[4]

3.2 A randomized video priming treatment

To assess the extent to which implicit attitudes are malleable in response to a short prime, we used a two-minute video. The original video was developed by *Jeune Afrique*, a French-language pan-African weekly news magazine, for "13 August Tunisia Women's Day".[5] The video features all legal achievements on women rights in Tunisia starting from 1956, with the Code du Statut Personnel established by Habib Bourghiba.[6] The video has three interrelated goals: first, it is intended to provide information about women's legal rights. Even though every Tunisian citizen may be expected to know their rights, this is by no means guaranteed. Especially in areas where strong conservative norms prevail, people may be less aware of actual laws safeguarding women's legal rights. Second, the video can be seen as a form of weakening gender stereotypes (Dasgupta & Greenwald, 2001). The video shows women across Tunisian society protesting and speaking in public to demand equal rights to men. These women are pictured against a background of banners with highlighted achievements thus far, including the abolishment of polygamy and repudiation of women, contraceptive and abortion rights, gender equality in the constitution as well as legal measures to protect women from violence and rape. Third, the video may be interpreted as a means to weaken gender bias by priming the specific goal of female empowerment. The video provided information using subtitles in French, to which we added a female voice-over in Tunisian Arabic transmitting the same facts.

Half of the households selected for the IAT were exposed to the two-minute video by *Jeune Afrique* (treatment group), whereas the other half was presented an equally long, but neutral "placebo video" on Tunisia's UNESCO World Heritage Sites (control group). The placebo video was comparable to the treatment video in terms of length, female voice-over in Tunisian Arabic, informational banners appearing on-screen in French language, and music. We randomized the video intervention at the household level to simplify the task of the enumerators (Glennerster & Takavarasha, 2013). Table C.1 in the Appendix C shows that randomization was generally successful; none of the regression coefficients are statistically significant except for self-reported

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[4]We only have full information on explicit attitudes for 399 respondents due to a mistake in the algorithm that allocated questionnaires across households. We test whether this type of attrition is related to any of the covariates. As one would expect given the technical nature of this error, there is no systematic relationship between socio-demographic characteristics and having missing information. The only significant coefficient is associated with living in a rural area (see Table C.2 for the test of systematic attrition in Appendix C). We control for this imbalance in all our regressions.

[5]For the original video see: `http://dai.ly/x5wnrqo`

[6]Due to the fact that a near equivalent of this video was freely available on the internet, there is a small, but non-zero possibility that people in both the treatment and control group had already seen the video. Our randomized intervention should therefore perhaps be interpreted as a randomized encouragement design.

attitudes on gender inequality.[7]

3.3 An IAT on women's empowerment

Implicit association tests (IAT) are used in social psychology, neuroscience and more recently in (development) economics, to measure implicit attitudes towards race, religion and sexual orientation (see Beaman et al., 2012; Greenwald, McGhee, & Schwartz, 1998; Greenwald et al., 2003; Lowes et al., 2015; McConnell & Leibold, 2001; Vogt, Efferson, & Fehr, 2017). Implicit association tests measure the strength of an association between a concept (e.g., homosexuality/heterosexuality) and an evaluation (e.g., bad/good) or stereotype (e.g., feminine/masculine) by measuring the reaction time it takes a respondent, on average, to categorize words (that reflect the respective concepts and evaluations/stereotypes). Respondents sit in front of a computer screen and only use three keys on a keyboard ("E", "I" and the spacebar). Participants go through a sequence of tasks, each called a "block". During each block the respondent needs to correctly categorize a series of target and attribute stimuli as fast as possible. Respondents see words appearing one by one on the screen and press the appropriate key: "E" if the word belongs to the category on the left side of the screen and "I" if it belongs to the category on the right side of the screen.

Table 1 presents our target stimuli: popular Arab Tunisian male and female names selected after careful consideration with our local partners. Names had to be common enough to be immediately recognized as male or female, not tied to a specific group or social class, and have no connotations with specific events or attributes. Attribute stimuli were Arab words associated with "dependence" or "independence" to operationalize the concept of empowerment (we provide a more detailed discussion on the choice for using dependence and independence in the course of this section).[8] The basic premise of an IAT is that pairing concepts, for example "Sarah" and "leader" is easier (faster) if a respondent associates these concepts more strongly than others, such as "Sarah" and "follower".[9]

All words appear on-screen requiring respondents to be sufficiently proficient in reading Arabic. We decided against using audio and visual IATs as for example in Beaman, Chattopadhyay, Duflo, Pande, and Topalova (2009) for the following reasons. First, and most importantly, the broad concept of empowerment and its antonym is difficult to capture in pictures. Indeed, pretesting the visual IATs confirmed our belief that pictures were considered ambiguous. Second, people in a pre-test also found it difficult to listen to audio-recordings. Third, the concept of

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[7]Although our video treatment was randomly allocated, there is some imbalance of treatment allocation with respect to self-reported explicit attitudes on gender inequality. We test the robustness of our impact heterogeneity results to these imbalances with a special variant of matching based on propensity score weighted regressions. We present the matching results in Appendix D.

[8]Technically, we are measuring gender stereotypes with this specific IAT design rather than preferences for female empowerment. We believe these measures are related, but a taste-based IAT may conceivably have generated different results.

[9]We explain the full IAT procedure and blocking scheme in Appendix B.

Table 1: IAT stimuli

Target stimuli		Attribute stimuli	
Female name	Male name	Dependent	Independent
Saida	Mehdi	Weak	Strong
Nour	Walid	Obedient	Lead
Sarah	Nizar	Follower	Decide
Hela	Karim	Incapable	Influence
Sonia	Sami	Submission	Capable
Mariem	Khaled	Oppressed	Succeed

empowerment had to be understandable to all. We jointly decided with our local partners that the Arabic translation of the words independence and dependence would come closest to what the average person in Tunisia would understand as empowerment and its antonym. Our choice for using words on-screen, instead of audio has some implications for the external validity of our sample as we could only include respondents that are literate. Yet, literacy rates in Tunisia in 2014 were close to 86% for men (World Bank, 2014b) and just below 72% for women (World Bank, 2014a), suggesting we have not compromised too much on the external validity of our sample. Also, confining the sample to literate people arguably reduces the possible problem of measuring people's capability to deal with the task at hand instead of measuring their implicit attitudes towards empowerment. We decided to follow Greenwald et al. (2003) in developing an IAT with seven blocks. The number of blocks and trials is of course an arbitrary choice, but the literature suggests that IAT measures are relatively robust to procedural variations such as the number of trials, the number of examples per concept and the time interval between trials (Greenwald et al., 2009).

We programmed the IAT in Tunisian Arabic using Inquisit 5.0 software and administered it to both experimental groups immediately after the videos. The IAT took on average 25 minutes. Each household member would first watch the video by him- or herself and take the test individually. We measured reaction time in milliseconds and calculated implicit attitudes from an IAT D-score, a statistic with a range of -2.0 to 2.0 (Greenwald et al., 2003). We calculate IAT D-scores by dividing the difference in reaction time for two pairings by the standard deviation of all reaction times across conditions. Hence, the score has the character of a standardized effect size measure. Absolute values below 0.2 can be considered as small effects, between 0.2 and 0.5 as medium effects, and larger than 0.5 as large effects (Cohen, 1977). Negative IAT D-scores signal rather progressive gender attitudes where people more easily pair "independent" with "women" and "dependent" with "men", whereas positive IAT D-scores signal rather conservative gender attitudes where people find it easier to pair "independent" with "men" and "dependent" with "women".

3.4 Explicit attitudes towards women's empowerment

To measure "explicit" gender attitudes, we rely on two sets of responses to statements related to female empowerment: (i) gender inequality and (ii) domestic violence. Respondents were requested to indicate their (dis)agreement to each statement on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree". More precisely, each respondent was asked the following seven questions related to attitudes towards gender inequality:

(1) *A man should have the final word about important decisions in the home.*
(2) *Men should decide whether a woman can work outside the house.*
(3) *Jobs should rather be given to men than to women.*
(4) *Men should take the decision with respect to a woman's education.*
(5) *Men should decide where a woman can go to and when.*
(6) *Doing the cooking, cleaning and washing are a woman's responsibility.*
(7) *A young woman should obey her brother(s).*

Each statement relates to female decision-making power in different domains; Statement 1 is a fairly straightforward measure for attitudes towards decision-making in the household. Statements 2-6 relate to attitudes towards decisions on women's occupation and employment opportunities, education, mobility and time use. These dimensions directly affect the daily life of women and are core dimensions in other empowerment surveys (see e.g., Alkire et al., 2013), where women are considered empowered if they can take control over and make their own decisions related to these aspects. The last item (Statement 7) relates to obedience towards brothers and is particular to more conservative families where women are not only expected to be subordinate to the male primary decision-maker, but also to younger and next-in-line male members of the family.

Another correlate to female empowerment is domestic violence. Actual domestic violence against women is a very direct and substantial threat to female empowerment. However, even if women are just exposed to the menace of violence or perceive that violence against women is justified in certain cases, this represents a serious threat to their empowerment. The respondents answered the following six questions related to domestic violence on the same 5-point Likert scale as in the gender inequality module:[10]

It is justified that a man hits or beats his wife...

(1) *if she goes out without telling him.*

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[10]These questions were taken from the Demographic and Health Surveys (DHS) (see: `https://dhsprogram.com/`) and hence have already been asked in the same way in many countries. Yet, the DHS questions also include the statement *It is justified that a man hits or beats his wife if she refuses to have sex with him.* We omitted this statement after discussions with our local partners as it was judged as being too sensitive and therefore carried a risk that many respondents would, at best, refuse to answer the question or, at worst, end the interview.

(2) *if she neglects the children.*

(3) *if she argues with him.*

(4) *if she buys things without his consent.*

(5) *if she applies for a new job or engages in a new livelihood without his consent.*

(6) *if she files a complaint against him to a higher authority or the police.*

For the analysis of explicit attitudes, we construct measures to summarize the statements on gender inequality and domestic violence. First, we transform the answer category from a 5-point Likert scale to a binary choice consisting of "agreeing" with a specific statement where "agreeing" means respondents either answered they "strongly agree", they "somewhat agree" or they "neither agree, nor disagree". For the interpretation we believe that "agreeing" reflects a rather conservative attitude with an inclination towards gender inequality and justification for domestic violence as it is clearly not reflective of a progressive view on women's empowerment. The corresponding opposite category consists of "disagreeing" where the respondents answered either "somewhat disagree" or "strongly disagree". For both the gender inequality and the domestic violence module we then calculate the number of statements that a respondent does "agree" with. As a consequence, a higher share of statements (either out of seven for gender inequality or out of six for domestic violence) indicates higher tolerance for gender inequality and domestic violence, and hence more conservative attitudes.

3.5 Interviewer characteristics

We argue that a video intervention may affect implicit gender attitudes, yet, we believe that more subtle cues like the personal traits of the interviewer or experimenter may play a role too. Moreover, we are interested in examining whether both implicit and explicit measures are affected. We look at two traits we deem particularly relevant for our setting: gender and perceived religiosity. We selected a group of 21 enumerators between 26 and 42 of age, and coming from different locations in Tunisia. The allocation of enumerators was based on practical and organizational conditions related to the execution of the survey. The survey team consisted of six interviewer teams with one group leader and three to four interviewers. Of the 21 interviewers that conducted the interviews, eleven were female and six of the female interviewers were wearing a hijab.[11][12] Although we did not formally randomly assign enumerators and, thus, treat it as a quasi-experiment, in practice, it was nearly a random process. That is, interviewers were

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[11]Our total sample of enumerators is small. Yet, the number is very much in line with other studies that look at interviewer effects in a developmental field setting (see e.g., Blaydes & Gillum, 2013).

[12]Of course, other characteristics are correlated with gender and/or wearing a hijab as well, and could possibly affect responses through these alternative channels. Yet, it is difficult to think of other characteristics that are (i) correlated with being a woman or wearing a hijab that are observable to the interviewee in the relatively short time the interviewer and interviewee meet and (ii) affect responses in a similar way as we hypothesize for our two key characteristics. We are therefore not concerned that these other channels may drive our results.

assigned to houses by the group leader with none of them having any prior knowledge on people living in a particular house. We never heard of interviewers being replaced after entering a respondent's house. We are therefore less concerned with self-selection issues, which is confirmed by a balance test (see Table C.3 in Appendix C). The test only shows that individuals that are unemployed were slightly less likely to be interviewed by a woman, whereas individuals with wage work or entrepreneurs are slightly more likely to be interviewed by a female enumerator. Moreover, young and married respondents are slightly more likely to be interviewed by a female enumerator wearing a hijab. We control for these imbalances in all our regressions.

4 Empirical strategy

We rely on the cluster randomized treatment assignment to estimate the intention-to-treat (ITT) impact of the video intervention on implicit attitudes towards women's empowerment. In our benchmark specification we regress the IAT D-score on the treatment status and a set of control variables:

$$Y_{ijv} = \alpha + \beta_1 T_{jv} + \beta_2 G_{ijv} + \beta_3 T_{jv} \times G_{ijv} + \beta_4 X_{ijv} + \beta_5 Z_{jv} + \varepsilon_{ijv}, \tag{1}$$

where Y_{ijv} is the IAT D-score for individual i in household j and sector v. T_{jv} is an indicator variable taking the value of 1 for treatment households. Since we expect that men and women may react differently to the video, we include an interaction term between treatment and gender. The latter enters the equation in form of the indicator variable G_{ijv}, which takes on the value of 1 if the respondent is female. X_{ijv} is a vector of individual control variables including age, marital status, education, occupation and migration background, but also self-reported explicit attitudes on gender inequality and domestic violence. Z_{jv} is a vector of household level controls (i.e., location of the household), including interviewer characteristics (i.e., gender and perceived religiosity).[13] ε_{ijv} is the error term. All standard errors are clustered at the household level. The coefficients β_1 and β_3 estimate the ITT impact of the video treatment using ordinary least squares (OLS), where β_1 represents the treatment effect for male respondents and $\beta_1 + \beta_3$ the effect for female respondents.

To further assess impact heterogeneity, we use the constructed measures of explicit attitudes (described in Section 3.4) as our proxy for conservative versus progressive attitudes. We adjust Equation 1 by including a vector of two categorical variables that each refer to different categories of self-reported explicit attitudes for gender inequality and domestic violence, respectively, and their interaction with the treatment indicator variable:

$$Y_{ijv} = \alpha + \beta_1 A_{ijv} + \beta_2 T_{jv} + \beta_3 A_{ijv} \times T_{jv} + \beta_4 X_{ijv} + \beta_5 Z_{jv} + \varepsilon_{ijv}, \tag{2}$$

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[13]For a detailed definition and summary statistics of the covariates see Table A.1 and Table A.2 in Appendix A.

where A_{ijv} is the vector of a categorical variable indicating the attitude towards (i) gender inequality and (ii) domestic violence of individual i in household j and sector v. The categories consist of the number of statements a respondent is "agreeing" with, where a low category ("agreeing" with zero statements) indicates progressive and a high category ("agreeing" with all seven/six statements) represents conservative attitudes. We refrain from using a double interaction with respondent gender to facilitate the interpretation of results and simply estimate the effects separately for the male and female sub-samples.

In our final set of regressions we identify the effect of interviewer characteristics on our outcomes of interest: implicit and explicit attitudes. First, we extend Equation 1 as follows:

$$Y_{ijv} = \alpha + \beta_1 G_{ijv} + \beta_2 I_{jv} + \beta_3 G_{ijv} \times I_{jv} + \beta_4 X_{ijv} + \beta_5 Z_{jv} + \varepsilon_{ijv}, \qquad (3)$$

where I_{jv} is an indicator variable representing the interviewer characteristics; it takes on the value of 1 (i) if the enumerator interviewing household j in sector v is female and (ii) if the interviewer is female wearing a hijab. We control for treatment status too, and always include an interaction term of the respondent's gender and the respective interviewer characteristic.

Second, we repeat the analysis depicted in Equation 3, but replace the dependent variable with explicit attitudes:

$$A_{ijv} = \alpha + \beta_1 G_{ijv} + \beta_2 I_{jv} + \beta_3 G_{ijv} \times I_{jv} + \beta_4 X_{ijv} + \beta_5 Z_{jv} + \varepsilon_{ijv}, \qquad (4)$$

with A_{ijv} now indicating the share of statements a respondent is "agreeing" with. We estimate Equation 4 separately for our two explicit attitude measures: (i) the share of gender inequality statements "agreeing" with and (ii) the share of domestic violence statements "agreeing" with.

5 Results

5.1 Descriptive statistics

We first present the distribution of the overall IAT D-scores with a histogram in fractions and a normal density function for comparison (see Figure 1). Note that this distribution is not a baseline as about half of the sample had been exposed to the treatment video. The mean score is 0.03, indicating that on average there is a slight tendency to associate women with dependence and men with independence. Yet, there is substantial variation in outcomes where a non-negligible group (about 15% of our sample) has scores between 0.5 and 1, demonstrating severely biased gender attitudes. At the same time, we observe some 9% of our sample having very progressive gender attitudes, supporting the notion of a deep political and cultural divide in Tunisian society.

Figure 1: Distribution of IAT D-scores
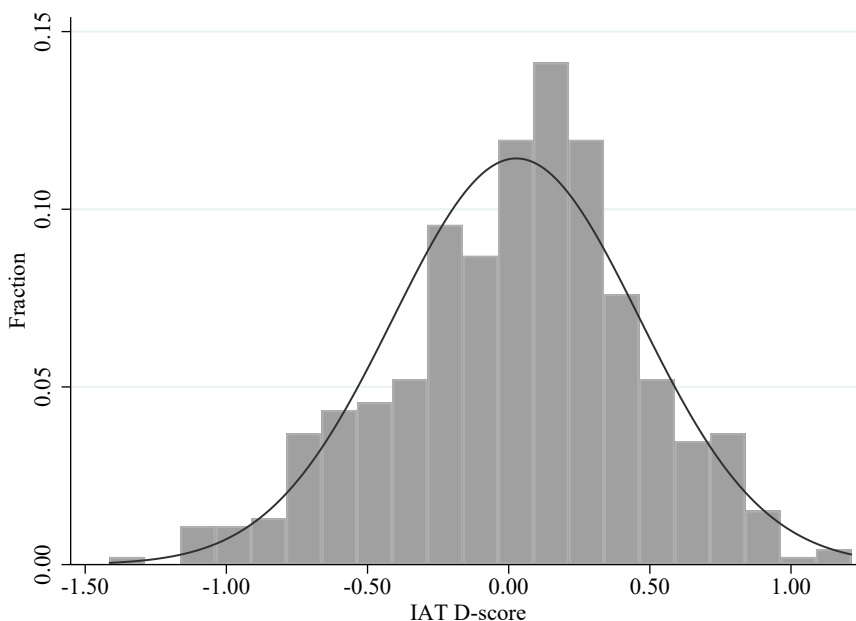
Note: The mean IAT D-score is 0.027 (SD = 0.437, N = 460). A positive score with IAT-D ϵ [0, 2] indicates implicit associations between dependent/women and independent/men. A negative score with IAT-D ϵ [−2, 0] indicates implicit associations between independent/women and dependent/men.

Table 2 shows the descriptive statistics for the explicit attitude measures for the male and female sub-samples. The figures in Panel A depict that the support for gender inequality is high for both men and women, although more pronounced for the male sub-sample. This reflects conservative social norms that still prevail in Tunisian society. For both men and women proportions are highest on "obedience to brothers" followed by the first item on male decision-making in the household and are lowest on the decision with respect to a woman's education. The self-reported attitudes towards domestic violence depicted in Panel B are less pronounced, although almost 30% of men in our sample agree with the statement that a man can beat his wife if she neglects the children. The remaining shares of "agreeing" with the other statements range from 21% to 25%. As with gender inequality, we also observe that women on average have a more progressive view on all items than men, yet, even among women there is some support for domestic violence against women. To illustrate the overall distribution, Figure 2 presents the fraction of respondents "agreeing" with zero to seven (gender inequality) or zero to six (domestic violence) statements.

5.2 Impact of the video treatment

Our main hypothesis is that the brief video treatment affects implicit attitudes towards women's empowerment. Figure 3 presents the distributions of the IAT outcomes with kernel density plots

Table 2: Explicit attitudes towards gender inequality and domestic violence

	Share "agreeing"	
	(1) Men	(2) Women
(A) Gender inequality		
1. A man should have the final word about important decisions in the home.	0.766	0.670
2. Men should decide whether a woman can work outside the house.	0.617	0.541
3. Jobs should rather be given to men than to women.	0.752	0.600
4. Men should take the decision with respect to a woman's education.	0.593	0.492
5. Men should decide where a woman can go to and when.	0.706	0.492
6. Doing the cooking, cleaning and washing are a woman's responsibility.	0.678	0.622
7. A young woman should obey her brother(s).	0.794	0.730
(B) Domestic violence		
It is justified that a man hits or beats his wife…		
1. if she goes out without telling him?	0.224	0.227
2. if she neglects the children?	0.299	0.265
3. if she argues with him?	0.252	0.205
4. if she buys things without his consent?	0.206	0.162
5. if she applies for a new job/engages in a new livelihood without consent?	0.210	0.184
6. if she files a complaint against him to the police?	0.243	0.211
No. of observations	214	185

Note: "agreeing" = [strongly agree | somewhat agree | neither agree nor disagree] vs. "disagreeing" [somewhat disagree | strongly disagree].

Figure 2: Explicit attitude descriptives
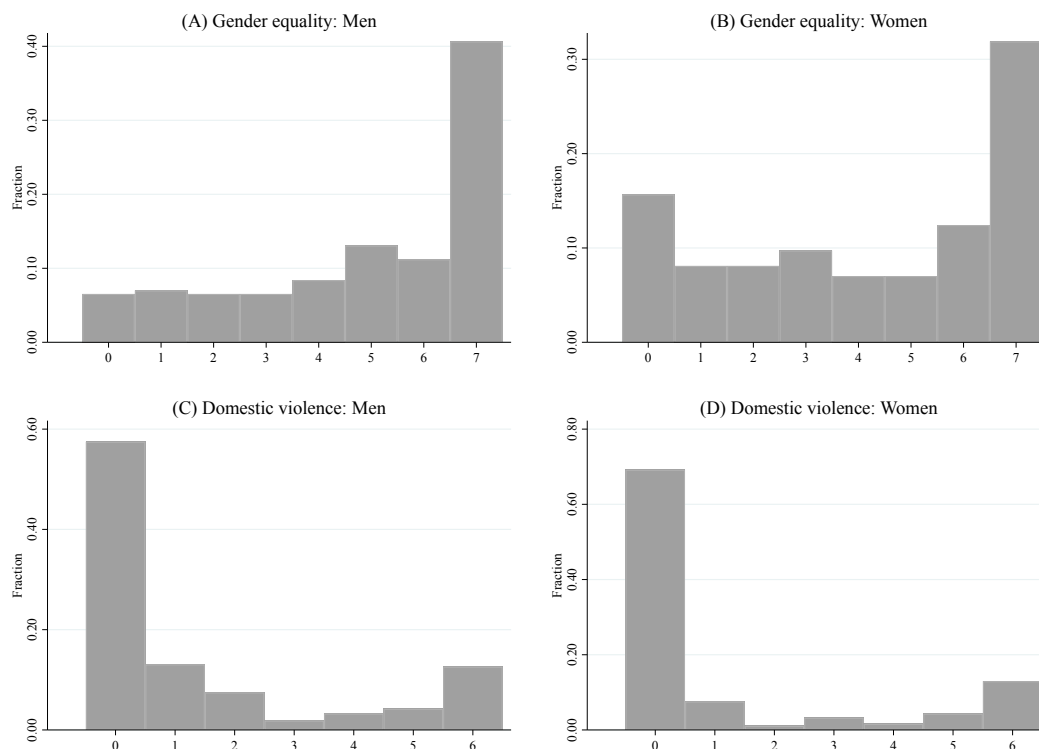
Note: (A) Men: Number of statements on gender inequality "agreeing" with (out of seven). (B) Women: Number of statements on gender inequality "agreeing" with (out of seven). (C) Men: Number of statements on domestic violence "agreeing" with (out of six). (D) Women: Number of statements on domestic violence "agreeing" with (out of six).

for both treatment and control groups, and for men and women separately.

The solid gray line represents outcomes for the treatment group and the dashed gray line represents the control group. The p-value of a Hartigan dip test for unimodality is 0.997 for the treatment group and 0.991 for the control group, which implies that the treatment does not generate any change in the unimodal distribution of implicit attitudes. Moreover, a two-sided Wilcoxon rank-sum test cannot reject the null hypothesis that treatment and control observations have the same distribution (p=0.866) implying that the video treatment does not provoke an average location shift of the IAT D-score distribution, neither up- nor downwards. Results, however, become slightly more pronounced when looking at the subgroups. Part B in Figure 3 presents the distribution for the sub-sample of men. Again, we do not see much difference between the two groups. If anything, the treatment group tends to display slightly more conservative attitudes.[14] By contrast, for our sub-sample of women it seems that our

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[14]When using a trimmed sample of individuals that had at least 60%, 65% or 70% of correct initial responses we observe an increase in the overall mean IAT D-score to 0.06, 0.08 and 0.10, respectively. Also, removing this type of noise affects the unconditional means in the sub-sample for men where the p-value of our rank-sum test then is smaller than 0.1. These results, however, do not hold up in the regression analysis.

Figure 3: Impact of video treatment on IAT D-scores for the overall sample and by gender
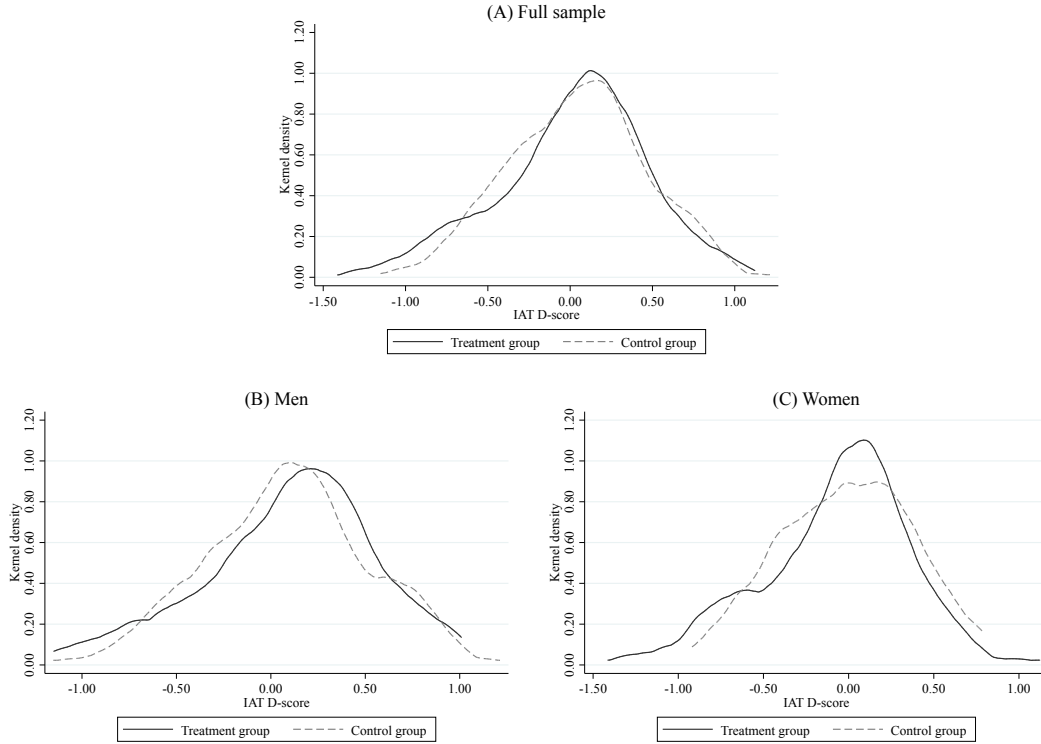
Note: (A) The full sample (N=460). (B) The male sample (N=247). (C) The female sample (N=213).

treatment may reduce extreme attitudes; the variance is smaller than that in the control group and the peak of the distribution centers around zero, indicating neutral or moderate attitudes. Yet, also here the result is not significantly different from zero.

Next, we estimate outcomes in a multivariate regression framework. Table 3 presents the results of regressing the IAT D-score on a treatment dummy and the interaction with the respondent's gender, including a relevant set of control variables (see Equation 1). The results confirm the patterns described above: the video treatment does not reveal a significant average treatment effect – neither for male, nor female respondents.

However, given the strong political and religious divide in present-day Tunisia we may expect certain groups in society to react differently to the video. We therefore look at impact heterogeneity in Table 4, where we investigate whether implicit responses to the treatment covary with explicit self-reported attitudes towards gender inequality and domestic violence, respectively (see Equation 2). Panel A describes the results for our first heterogeneity measure, which is gender inequality. Although there does not seem to be a clear pattern for men, we do observe considerable "action" for the sub-sample of women. First, there is a positive correlation between explicit and implicit attitudes, regardless of treatment. That is, women that agree with a higher number of statements, indicating more conservative attitudes, have higher IAT D-scores and hence, are more biased against women. Second, particularly women with conservative explicit

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Table 3: Impact of video treatment on IAT D-scores

	IAT D-scores	
	(1)	(2)
Video treatment (=1)	0.006	0.005
	0.056	0.062
Woman (=1)	-0.101*	-0.082
	0.055	0.069
Treatment × Woman	-0.067	-0.050
	0.081	0.096
Constant	0.087**	0.040
	0.039	0.181
Controls	NO	YES
No. of observations	460	399
No. of households	288	255
Adjusted R-squared	0.021	-0.004

Note: OLS estimates with robust clustered standard errors in parentheses; standard errors are clustered at the HH-level. Further controls include gender, age category (18-30 years), marital status, level of education, occupational status in past 12 months, migration status (to EU or North American country), location of HH (rural, governorate on coast), interviewer characteristics (gender and perceived religiosity) and explicit attitude measures (towards gender inequality and domestic violence). *** indicates significance at 1%, ** at 5%, and * at 10%.

attitudes on gender inequality respond to the treatment; treated conservative women are more likely to associate women with independence than untreated conservative women. The video thus triggers, at least in the short run, an increase in the association of women with empowerment, for women that report more conservative gender attitudes. Turning to Panel B that presents heterogeneous impacts by our second explicit measure, which are attitudes towards domestic violence, we see that the coefficients are negative but not statistically significant.

One could argue that our measures of conservative versus progressive attitudes are somewhat arbitrarily defined and results may be driven by these particular measures. We therefore test for the robustness of our findings using alternative measures based on the share of statements a respondent is "agreeing" with and alternative categories for the number of statements a respondent is "agreeing" with. Also, we create an index by weighting the answers to the gender inequality and domestic violence module, using multiple correspondence analysis (MCA). Detailed descriptions of the alternative measures and the respective results are presented in Appendix E. Overall, our results are robust to alternative measures of explicit attitudes. As with our original measure, we do not observe any consistent differential effects of our treatment on IAT D-scores among men. However, irrespective of the measure, we do largely observe that more conservative women react to the treatment, which translates into more progressive IAT D-scores. This effect is significant when differentiating between conservative and progressive women by using explicit

Table 4: Impact of video treatment on IAT D-scores, by explicit attitudes

	IAT D-score			
	(1)	(2)	(3)	(4)
	Men		Women	
(A) Gender inequality				
Video treatment (=1)	-0.155	-0.175	0.256*	0.299*
	(0.287)	(0.238)	(0.155)	(0.155)
No. statements "agreeing"; 0	Ref.	Ref.	Ref.	Ref.
1-6	0.027	-0.038	0.285*	0.347**
	(0.223)	(0.206)	(0.148)	(0.147)
7	-0.208	-0.293	0.394***	0.440***
	(0.223)	(0.205)	(0.147)	(0.149)
Treatment × 1-6	0.102	0.125	-0.254	-0.297
	(0.299)	(0.258)	(0.179)	(0.187)
Treatment × 7	0.187	0.249	-0.423**	-0.454**
	(0.301)	(0.255)	(0.188)	(0.190)
Constant	0.164	-0.197	-0.317**	-0.262
	(0.215)	(0.445)	(0.134)	(0.175)
Controls	NO	YES	NO	YES
No. of observations	214	214	185	185
Adjusted R-squared	0.020	0.030	0.002	-0.040
(B) Domestic violence				
Video treatment (=1)	-0.052	-0.040	-0.001	-0.006
	(0.085)	(0.090)	(0.076)	(0.080)
No. statements "agreeing"; 0	Ref.	Ref.	Ref.	Ref.
1-5	-0.123	-0.176	0.069	0.033
	(0.098)	(0.108)	(0.114)	(0.119)
6	-0.163	-0.188	0.116	0.122
	(0.130)	(0.127)	(0.116)	(0.121)
Treatment × 1-5	0.088	0.120	-0.047	0.000
	(0.134)	(0.144)	(0.181)	(0.187)
Treatment × 6	0.159	0.092	-0.180	-0.171
	(0.189)	(0.190)	(0.232)	(0.233)
Constant	0.140**	-0.288	-0.049	0.062
	(0.065)	(0.447)	(0.061)	(0.142)
Controls	NO	YES	NO	YES
No. of observations	214	214	185	185
Adjusted R-squared	-0.013	0.007	-0.019	-0.065

Note: OLS estimates with robust clustered standard errors in parentheses; standard errors are clustered at the HH-level. Further controls include age category (18-30 years), marital status, level of education, occupational status in past 12 months, migration status (to EU or North American country), location of HH (rural, governorate on coast) and interviewer characteristics (gender and perceived religiosity). "Agreeing" with none (=0) of the statements reflect progressive norms, whereas "agreeing" with all seven/six statements represents conservative norms. *** indicates significance at 1%, ** at 5%, and * at 10%.

attitudes on gender inequality. Yet, when using attitudes towards domestic violence questions, the sign of the interaction effect is still negative, but not significant.

5.3 Interviewer effects on implicit and explicit attitudes

Panel A of Table 5 presents the results of the effects of interviewer gender and perceived religiosity on implicit attitudes (see Equation 3). Columns 1 and 2 present the interviewer gender effects and Columns 3 and 4 present the perceived religiosity effect for respondents interviewed by the female enumerators. We find statistically significant effects that female interviewers reinforce conservative implicit attitudes; the IAT D-score increases on average by 0.14 to 0.15 points. Respondents may see female interviewers as a threat, which might reinforce negative attitudes towards empowerment when interviewed by a female enumerator. This effect is driven by our male sub-sample testified by the negative interaction between female interviewer and female respondent. Lastly, wearing a hijab does not seem to reinforce an implicit gender bias.

Panel B and C in Table 5 present results with explicit attitudes as our dependent variable (see Equation 4). We use the share of statements that a respondent is "agreeing" with as the dependent variable; the variable ranges between 0 ("agreeing" with none of the statements) and 1 ("agreeing" with all seven or six statements). Hence, a positive coefficient would indicate more conservative attitudes on gender inequality and domestic violence, respectively. In Panel B we find explicit attitudes on gender inequality not to be sensitive to the interviewer's gender. When it comes to perceived religiosity, we find that an enumerator wearing a hijab induces more conservative responses, although this is not robust to adding covariates. For attitudes towards domestic violence (Panel C), we find interviewer gender effects. Female interviewers on average invite more conservative responses, and moreover, there is a strong positive association between perceived religiosity and self-reported attitudes. This latter result suggests that respondents increasingly align their answers with perceived norms of the interviewer if topics become more sensitive (which is arguably the case here, as we expect the topic of gender inequality to be less sensitive than that of domestic violence). Taken together with the absence of such an effect for the IAT D-scores we interpret this as suggestive evidence of social desirability issues at work when using self-reported measures.

6 Discussion and conclusion

This study provides a new application of a measurement tool to assess implicit gender attitudes, alongside explicit self-reported survey responses in a developing country field setting. We examine the malleability of implicit and explicit gender attitudes in response to a randomized video intervention and natural variation in interviewer characteristics.

We find that short primes have little average effects on Tunisian citizens but reduce gender biased attitudes for a specific subgroup of conservative women as measured by their explicit

Table 5: Interviewer effects on implicit and explicit attitudes

	(1)	(2)	(3)	(4)
(A) IAT D-score				
Woman (=1)	-0.043	-0.032	-0.223**	-0.186*
	(0.070)	(0.073)	(0.101)	(0.106)
Female interviewer (=1)	0.135**	0.145**		
	(0.062)	(0.064)		
Woman × Female interviewer	-0.148*	-0.150*		
	(0.086)	(0.088)		
Interviewer w/ headscarf (=1)			-0.046	-0.026
			(0.072)	(0.070)
Woman × Headscarf			0.047	0.059
			(0.116)	(0.119)
Controls	NO	YES	NO	YES
No. of observations	460	460	296	296
No. of households	288	288	177	177
Adjusted R-squared	0.030	0.017	0.040	0.041
(B) Gender inequality				
Woman (=1)	-0.107	-0.103*	-0.195***	-0.184***
	(0.066)	(0.061)	(0.070)	(0.068)
Female interviewer (=1)	0.086	0.051		
	(0.060)	(0.055)		
Woman × Female interviewer	-0.006	0.022		
	(0.076)	(0.069)		
Interviewer w/ headscarf (=1)			0.117**	0.067
			(0.056)	(0.054)
Woman × Headscarf			0.099	0.136*
			(0.081)	(0.075)
Controls	NO	YES	NO	YES
No. of observations	399	399	251	251
No. of households	255	255	153	153
Adjusted R-squared	0.028	0.096	0.074	0.159
(C) Domestic violence				
Woman (=1)	-0.030	-0.023	-0.079*	-0.028
	(0.048)	(0.051)	(0.044)	(0.055)
Female interviewer (=1)	0.147***	0.142***		
	(0.053)	(0.050)		
Woman × Female interviewer	-0.007	0.016		
	(0.063)	(0.062)		
Interviewer w/ headscarf (=1)			0.244***	0.243***
			(0.060)	(0.063)
Woman × Headscarf			0.033	0.052
			(0.069)	(0.070)
Controls	NO	YES	NO	YES
No. of observations	399	399	251	251
No. of households	255	255	153	153
Adjusted R-squared	0.031	0.037	0.084	0.095

Note: The dependent variable for Panel A is the IAT D-score. Panel B and C have the share of statements on gender inequality and domestic violence that the individual is "agreeing" with as the dependent variable. OLS estimates with robust clustered standard errors in parentheses; standard errors are clustered at the HH-level. Further controls include age category (18-30 years), marital status, level of education, occupational status in past 12 months, migration status (to EU or North American country), location of HH (rural, governorate on coast). In Panel A we also control for the treatment status. For Columns 1 and 2 we use the full sample, for Columns 3 and 4 the sample comprises only of those individuals that have been interviewed by a female interviewer. *** indicates significance at 1%, ** at 5%, and * at 10%.

attitudes. The video which shows real-life gender reforms affecting Tunisian society might have induced a change in the mindset of women in the treatment group. Though imperfect as a proxy, we believe our measure of explicit attitudes may be reflective of social norms. Due to the fact that particularly those with conservative explicit attitudes towards gender inequality have slightly more progressive implicit attitudes after seeing the video, we can think of two potential channels consistent with these results. First, there could be an information effect. Although progressive laws are in place in Tunisia, they are not necessarily known to all, possibly due to homophily effects in social networks (McPherson, Smith-Lovin, & Cook, 2001). Second, the video may change attitudes by weakening gender stereotypes, and women featuring in that video may serve as role models that help set progressive goals for the individual respondent. Thus, contrary to the widespread assumption that implicit attitudes tap into past experiences that are relatively resistant to change (Bargh, 1999; Petty et al., 2006), we find them to be malleable to short treatment interventions in line with Dasgupta (2013); Gawronski, Morrison, Phills, and Galdi (2017) and Lai et al. (2014). Although we cannot investigate whether a change in attitudes maps onto actual behavioral change, we can at least conclude that small nudges like our video can be effective in situations where gender-sensitive decisions have to be made. Future studies should investigate the effect of repeatedly exposing individuals to such treatments (or similar situations) or for a longer time, and assess whether this has a lasting impact on actual behavior.

In light of recent evidence reviewed by Di Maio and Fiala (2019) and Chapman, Benedict, and Schiöth (2018), we also test for interviewer effects for two arguably significant characteristics of the interviewer: gender and perceived religiosity (interviewers wearing a hijab). As we could not randomize these two aspects across treatment conditions and respondents, this takes the form of a quasi-experiment where we argue that enumerator selection on the basis of only logistical and practical considerations is unlikely to systematically correlate with our variables of interest. We find that the gender of the interviewer affects overall responses to both our explicit and implicit attitude measures, with effects being slightly more pronounced for the former. Female interviewers tend to invite more conservative implicit responses from men, whereas they have little effect on the implicit responses by women. This is consistent with earlier studies that report that men tend to react stronger towards provocation (Borden, 1975; Hyde, 2014). We also find that wearing a hijab (or conversely not wearing a hijab) invites more conservative (progressive) responses, but only for explicit attitudes. This suggests that self-reported survey questions on sensitive topics like domestic violence are prone to social desirability bias. This means that respondents align their answers with perceived norms of the interviewer, consistent with evidence reported by Benstead (2014) and Blaydes and Gillum (2013).

There are a number of caveats to our study. First, our design only allows us to measure impacts immediately after the priming intervention, so we do not know whether results sustain in the long run (see e.g., Weingarten et al., 2016). Second, we only measure the impact of the intervention with our IAT measure which makes it impossible to contrast it with standard self-reported survey outcomes. Third, our proxy for conservatism is clearly imperfect. Future studies

may want to use voting data or other observed measures indicative of conservatism. Fourth and finally – assessing the role of interviewer effects is best done in a controlled randomized setting.

Yet, we believe our study may inform policymakers on the potential power of light interventions and help improve on standard self-reported survey questions related to female empowerment. Coupled with policies and awareness they may change attitudes and behavior in the long run and thereby reduce discriminatory intentions and actions that produce structural gender inequalities. Recent evidence by Charlesworth and Banaji (2019) shows that long-term implicit attitudes with respect to sexuality, race and skin tones have all moved towards decreasing prejudice in just over a decade (2007-16). Gender equality may be next.

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Appendix

Appendix A: Definition of covariates

Table A.1: Definition of control variables

Variable	Type	Definition
Gender	Dummy	1 if female, 0 if male
Age category	Dummy	1 if aged 18-30 years, 0 if aged above 30 years
Marital status	Dummy	1 if married, 0 otherwise
Level of education	Categorical	0 if no schooling (reference category), 1 if primary education, 2 if secondary education, 3 if tertiary or higher education
Occupational status	Dummy	1 if entrepreneur or wage worker in past 12 months, 0 otherwise (inactive, unemployed or student)
Migration status	Dummy	1 if migrated to an EU or North American country, 0 otherwise
Area	Dummy	1 if rural, 0 if urban
Governorate	Dummy	1 if coastal, 0 if non-coastal

Table A.2: Descriptive statistics for control variables

	Mean		
	(1) Full sample	(2) Men	(3) Women
Woman (=1)	0.463		
Age (years)	37.5	38.1	36.8
Married (=1)	0.563	0.518	0.615
No education (=1)	0.028	0.016	0.042
Primary education (=1)	0.315	0.320	0.310
Secondary education (=1)	0.439	0.478	0.394
Tertiary or higher education (=1)	0.217	0.186	0.254
Unemployed (=1)	0.209	0.235	0.178
Student/inactive (=1)	0.459	0.320	0.620
Wage worker (=1)	0.326	0.421	0.216
Entrepreneur (=1)	0.111	0.170	0.042
Migrant, any country (=1)	0.057	0.081	0.028
Migrant, EU/North America (=1)	0.026	0.036	0.014
Rural area (=1)	0.387	0.401	0.371
Coastal governorate (=1)	0.543	0.538	0.549
No. of observations	460	247	213
No. of households	255		

Note: The employment status refers to 12 months before the survey; an individual can possibly have had various employment statuses within that period and therefore numbers do not necessarily add up to 100%. An individual is labeled a migrant when he or she has lived abroad for more than six months. Apart from rural vs. urban areas, we also look whether the individual is located in a coastal vs. non-coastal governorate. The relatively prosperous flat coastal zone is perceived to have a less conservative mindset than departments located in the poorer remote non-coastal zone of Tunisia.

Appendix B: Details on the IAT

Table B.1: Sequence of trial blocks in the women's empowerment IAT

Block	No. of trials	Function	Items assigned to left-key response	Items assigned to right-key response
1	20	Practice	Female names	Male names
2	20	Practice	Words associated with "dependent"	Words associated with "independent"
3	20	Practice	Female names and "dependent" words	Male names and "independent" words
4	40	Test	Female names and "dependent" words	Male names and "independent" words
5	20	Practice	Male names	Female names
6	20	Practice	Male names and "dependent" words	Female names and "independent" words
7	40	Test	Male names and "dependent" words	Female names and "independent" words

Table B.1 describes the blocking scheme of the IAT designed for this study. Respondents first practiced categorizing female and male names, followed by another practice block where they categorized words associated with dependence and independence. After two blocks of practice rounds respondents were presented with the double categorization task. In the stereotypical setting "female names" and "dependence" shared the same response key, whereas in the counter-stereotypical block "female names" and "independence" belonged to the same key. All respondents completed seven blocks. The first two blocks were for practicing single cues, block three presented a practice block with the stereotypical cues on each side, and block four was the same as block three, but the actual test block. Block five, six and seven repeated the steps in the first three blocks, now with the counter-stereotypical cues on each side. In each block, there is only one single correct response; for example, the name "Sarah" has to be categorized under "female name", the word "follower" has to be classified under "dependence". As described in the main text, the basic premise of an IAT is that pairing concepts, for example "Sarah" and "leader" is easier (faster) if a respondent associates these concepts more strongly than others, such as "Sarah" and "follower".

Appendix C: Balance tests

Table C.1: Video treatment balance test

	(1) Video treatment (=1)
Woman (=1)	-0.069
	(0.054)
Young; 18-30 years (=1)	0.054
	(0.088)
Married (=1)	0.141
	(0.095)
No education (=1)	Ref.
Primary education (=1)	-0.065
	(0.150)
Secondary education (=1)	-0.062
	(0.154)
Tertiary or higher education (=1)	-0.054
	(0.157)
Unemployed (=1)	-0.018
	(0.070)
Wage worker or entrepreneur (=1)	-0.066
	(0.058)
Migrant, EU/North America (=1)	-0.152
	(0.185)
Rural area (=1)	-0.028
	(0.070)
Coastal governorate (=1)	-0.034
	(0.070)
Gender inequality (No. statements "agreeing"); 0	Ref.
1-6	-0.158*
	(0.094)
7	-0.231**
	(0.106)
Domestic violence (No. statements "agreeing"); 0	Ref.
1-5	-0.063
	(0.070)
6	-0.141
	(0.105)
Constant	0.817***
	(0.206)
No. of observations	399
No. of households	255
Adjusted R-squared	0.012

Note: OLS estimates with robust clustered standard errors in parentheses; standard errors are clustered at the HH-level. *** indicates significance at 1%, ** at 5%, and * at 10%.

Table C.2: Balance of respondent characteristics with and without information on explicit attitudes

	(1) Missing information on explicit attitudes (=1)
Woman (=1)	-0.015
	(0.035)
Young; 18-30 years (=1)	0.082
	(0.057)
Married (=1)	0.044
	(0.061)
No education (=1)	Ref.
Primary education (=1)	0.018
	(0.106)
Secondary education (=1)	-0.064
	(0.104)
Tertiary or higher education (=1)	-0.009
	(0.102)
Unemployed (=1)	0.035
	(0.050)
Wage worker or entrepreneur (=1)	-0.030
	(0.037)
Migrant, EU/North America (=1)	0.053
	(0.118)
Rural area (=1)	-0.099***
	(0.035)
Coastal governorate (=1)	-0.056
	(0.039)
IAT D-score	0.024
	(0.033)
Constant	0.173
	(0.119)
No. of observations	460
No. of households	287
Adjusted R-squared	0.020

Note: OLS estimates with robust clustered standard errors in parentheses; standard errors are clustered at the HH-level. *** indicates significance at 1%, ** at 5%, and * at 10%.

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Table C.3: Interviewer balance test

	(1) Female interviewer (=1)	(2) Female interviewer with hijab (=1)
Woman (=1)	0.057	0.033
	(0.043)	(0.055)
Young; 18-30 years (=1)	0.074	0.139*
	(0.074)	(0.080)
Married (=1)	0.085	0.264***
	(0.079)	(0.092)
No education (=1)	Ref.	Ref.
Primary education (=1)	0.126	0.035
	(0.165)	(0.148)
Secondary education (=1)	-0.001	0.023
	(0.165)	(0.155)
Tertiary or higher education (=1)	-0.001	-0.104
	(0.166)	(0.160)
Unemployed (=1)	-0.168***	-0.236***
	(0.061)	(0.084)
Wage worker or entrepreneur (=1)	0.144***	-0.031
	(0.050)	(0.054)
Migrant, EU/North America (=1)	0.101	0.002
	(0.124)	(0.169)
Rural area (=1)	-0.024	-0.013
	(0.059)	(0.070)
Coastal governorate (=1)	-0.030	-0.125*
	(0.058)	(0.067)
Video treatment (=1)	-0.041	-0.049
	(0.059)	(0.066)
Constant	0.517***	0.621***
	(0.191)	(0.187)
No. of observations	460	296
No. of households	288	177
Adjusted R-squared	0.054	0.077

Note: OLS estimates with robust clustered standard errors in parentheses; standard errors are clustered at the HH-level. The sample in Column 2 comprises only of those individuals that have been interviewed by a female interviewer.*** indicates significance at 1%, ** at 5%, and * at 10%.

Appendix D: Matching

To estimate the robustness of our impact heterogeneity in Table 4 with respect to imbalances in treatment assignment regarding explicit attitudes, we apply a special variant of matching based on propensity score weighted regressions as proposed by Hirano and Imbens (2001) and Hirano, Imbens, and Ridder (2003). The basic idea here is to combine a propensity score approach with an OLS regression-based specification. The "matching estimation" gives the propensity scores that are used to create weights for the subsequent OLS regression in order to increase comparability between the assessed groups across observable characteristics of the individuals, including interviewer characteristics and explicit attitudes. In other words, control group observations are individually reweighed, so that they jointly become similar to the treatment group, particularly with respect to explicit attitudes. More precisely, we determine two propensity scores for men and women separately; one with covariates and gender inequality attitudes and the other with covariates and domestic violence attitudes. These propensity scores then enter a weight that is applied to the OLS regression. To attain the treatment effect, this individual weight can be computed as outlined in Brunell and DiNardo (2004) for both treatment and control observations i, denominated μ_i^T and μ_i^C respectively:

$$\mu_i^T = 1 \ and \ \mu_i^C = [(\Pr(T = 1|X))/(1 - (\Pr(T = 1|X))] \times (p^C/p^T), \quad \text{(D.1)}$$

where Pr stands for probability, the vector X for the covariates (including explicit attitudes), p^T for the fraction of treatment observations, and p^C refers to the fraction of control observations. The results of Table 4 applying propensity score weighted regressions are presented in Table D.1.

Table D.1: Impact of video treatment on IAT D-scores by explicit attitudes with propensity score weighted regressions

	IAT D-score			
	(1)	(2)	(3)	(4)
	Men		Women	
(A) Gender inequality				
Video treatment (=1)	-0.096	-0.147	0.212	0.234
	(0.315)	(0.250)	(0.170)	(0.145)
No. statements "agreeing"; 0	Ref.	Ref.	Ref.	Ref.
1-6	0.092	0.029	0.207	0.268*
	(0.257)	(0.211)	(0.172)	(0.141)
7	-0.168	-0.262	0.306*	0.339**
	(0.262)	(0.215)	(0.165)	(0.141)
Treatment × 1-6	0.037	0.076	-0.176	0.211
	(0.324)	(0.268)	(0.200)	(0.184)
Treatment × 7	0.147	0.230	-0.336*	-0.349*
	(0.331)	(0.269)	(0.202)	(0.184)
Constant	0.105	-0.258	-0.272*	-0.247
	(0.252)	(0.476)	(0.151)	(0.168)
Controls	NO	YES	NO	YES
No. of observations	214	214	185	185
Adjusted R-squared	0.025	0.036	0.006	-0.009
(B) Domestic violence				
Video treatment (=1)	-0.009	-0.006	-0.002	-0.002
	(0.094)	(0.097)	(0.079)	(0.078)
No. statements "agreeing"; 0	Ref.	Ref.	Ref.	Ref.
1-5	-0.065	-0.093	-0.003	-0.026
	(0.103)	(0.117)	(0.146)	(0.146)
6	-0.106	-0.133	0.008	0.041
	(0.136)	(0.139)	(0.122)	(0.125)
Treatment × 1-5	0.030	0.047	0.025	0.046
	(0.138)	(0.152)	(0.202)	(0.210)
Treatment × 6	0.103	0.067	-0.072	-0.098
	(0.193)	(0.193)	(0.235)	(0.237)
Constant	0.097	-0.431	-0.048	-0.009
	(0.076)	(0.451)	(0.064)	(0.143)
Controls	NO	YES	NO	YES
No. of observations	214	214	185	185
Adjusted R-squared	-0.020	-0.012	-0.026	-0.060

Note: OLS estimates with robust clustered standard errors in parentheses; standard errors are clustered at the HH-level. Further controls include age category (18-30 years), marital status, level of education, occupational status in past 12 months, migration status (to EU or North American country), location of HH (rural, governorate on coast) and interviewer characteristics (gender and perceived religiosity). "Agreeing" with none (=0) of the statements reflect progressive norms, whereas "agreeing" with all seven/six statements represents conservative norms. *** indicates significance at 1%, ** at 5%, and * at 10%.

Appendix E: Alternative measures for explicit attitudes

We moreover test for the robustness of our findings in Table 4 using the following alternative measures for our explicit attitudes on gender inequality and domestic violence, respectively:

i) The share of statements a respondent is "agreeing" with; the variable enters the regression in form of a continuous variable.

ii) The share of statements a respondent is "agreeing" with; the variable enters the regression in form of a binary variable which takes the value 1 if the respondent's share of statements "agreeing" ranges above the sample's median and 0 if below or equal to the median.

iii) Alternative categories of the number of statements a respondent is "agreeing" with. For the gender inequality module the categories are: agreeing to 0-1, agreeing to 2-5, and agreeing to 6-7 of the statements. For the domestic violence the categories are: agreeing to 0-1, agreeing to 2-4, and agreeing to 5-6 of the statements.

Moreover, we deviate from the "agreeing" versus "disagreeing" methodology and create an index by weighting the respondent's answers to the gender inequality and domestic violence module, respectively. For the weighting we apply multiple correspondence analysis (MCA) and take the first dimension for the index; higher values indicate more conservative attitudes. Further robustness measures are then:

iv) The MCA index; the variable enters the regression in form of a continuous variable.

v) The MCA index; the variable enters the regression in form of a binary variable which takes the value 1 if the respondent's index score ranges above the sample's median and 0 if below or equal to the median.

Table E.1: Impact of video treatment on IAT D-scores by explicit attitudes on gender inequality using alternative measures, male sample

	IAT D-score (Men)									
Gender inequality	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Share of statements "agreeing"		Share below/ above median		Alternative categories		MCA index		MCA index below/ above median	
Video treatment (=1)	-0.108	-0.143	-0.086	-0.108	-0.249	-0.263*	-0.012	0.001	-0.058	-0.076
	(0.147)	(0.140)	(0.102)	(0.105)	(0.170)	(0.159)	(0.061)	(0.062)	(0.089)	(0.095)
Continuous variable	-0.294**	-0.375***					-0.092**	-0.106**		
	(0.128)	(0.140)					(0.039)	(0.046)		
Treatment × Cont. variable	0.134	0.203					0.047	0.074		
	(0.187)	(0.180)					(0.062)	(0.062)		
Above median			-0.182*	-0.221**					-0.235***	-0.272***
(Ref. below/equal)			(0.095)	(0.104)					(0.089)	(0.100)
Treatment × Above median			0.113	0.171					0.044	0.108
			(0.128)	(0.132)					(0.123)	(0.130)
2-5 statements					-0.186	-0.291				
(Ref. 0-1)					(0.161)	(0.176)				
6-7 statements					-0.282**	-0.391***				
(Ref. 0-1)					(0.133)	(0.141)				
Treatment × 2-5					0.365*	0.378*				
					(0.208)	(0.207)				
Treatment × 6-7					0.173	0.229				
					(0.188)	(0.181)				
Constant	0.292***	-0.145	0.204**	-0.246	0.296**	-0.006	0.092**	-0.355	0.222***	-0.198
	(0.106)	(0.468)	(0.079)	(0.439)	(0.122)	(0.478)	(0.044)	(0.433)	(0.071)	(0.466)
Controls	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
No. of observations	214	214	214	214	214	214	214	214	214	214
Adjusted R-squared	0.014	0.035	0.003	0.019	0.047	0.056	0.008	0.021	0.039	0.049

Note: OLS estimates with robust clustered standard errors in parentheses; standard errors are clustered at the HH-level. Further controls include age category (18-30 years), marital status, level of education, occupational status in past 12 months, migration status (to EU or North American country), location of HH (rural, governorate on coast) and interviewer characteristics (gender and perceived religiosity). "Agreeing" with none (=0) of the statements reflect progressive norms, whereas "agreeing" with a high number of statements represents conservative norms. The MCA index uses the first dimension; higher values reflect more conservative norms. *** indicates significance at 1%, ** at 5%, and * at 10%.

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Table E.2: Impact of video treatment on IAT D-scores by explicit attitudes on gender inequality using alternative measures, female sample

Gender inequality	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Share of statements "agreeing"		Share below/ above median		Alternative categories		MCA index		MCA index below/ above median	
Video treatment (=1)	0.210*	0.206*	0.079	0.073	0.264*	0.285*	-0.043	-0.037	0.077	0.073
	(0.119)	(0.124)	(0.092)	(0.097)	(0.144)	(0.146)	(0.065)	(0.069)	(0.085)	(0.090)
Continuous variable	0.323**	0.328**					0.116**	0.116**		
	(0.128)	(0.136)					(0.049)	(0.054)		
Treatment × Cont. variable	-0.381**	-0.364**					-0.145**	-0.139**		
	(0.167)	(0.172)					(0.061)	(0.064)		
Above median			0.171*	0.161					0.184**	0.184**
(Ref. below/equal)			(0.092)	(0.098)					(0.088)	(0.093)
Treatment × Above median			-0.211	-0.187					-0.235*	-0.215*
			(0.129)	(0.130)					(0.126)	(0.129)
2-5 statements					0.231	0.267*				
(Ref. 0-1)					(0.148)	(0.150)				
6-7 statements					0.326**	0.347**				
(Ref. 0-1)					(0.144)	(0.149)				
Treatment × 2-5					-0.308*	-0.343*				
					(0.180)	(0.184)				
Treatment × 6-7					-0.407**	-0.409**				
					(0.176)	(0.179)				
Constant	-0.233**	-0.143	-0.115	-0.004	-0.264**	-0.172	-0.019	0.080	-0.109	-0.014
	(0.101)	(0.171)	(0.074)	(0.150)	(0.128)	(0.181)	(0.044)	(0.134)	(0.067)	(0.148)
Controls	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
No. of observations	185	185	185	185	185	185	185	185	185	185
Adjusted R-squared	0.016	-0.029	0.005	-0.043	0.006	-0.037	0.017	-0.029	0.009	-0.037

Note: OLS estimates with robust clustered standard errors; standard errors are clustered at the HH-level. Further controls include age category (18-30 years), marital status, level of education, occupational status in past 12 months, migration status (to EU or North American country), location of HH (rural, governorate on coast) and interviewer characteristics (gender and perceived religiosity). "Agreeing" with none (=0) of the statements reflect progressive norms, whereas "agreeing" with a high number of statements represents conservative norms. *** indicates significance at 1%, ** at 5%, and * at 10%. The MCA index uses the first dimension; higher values reflect more conservative norms.

Table E.3: Impact of video treatment on IAT D-scores by explicit attitudes on domestic violence using alternative measures, male sample

Domestic violence	(1) Share of statements "agreeing"	(2) Share of statements "agreeing"	(3) Share below/ above median	(4) Share below/ above median	(5) Alternative categories	(6) Alternative categories	(7) MCA index	(8) MCA index	(9) MCA index below/ above median	(10) MCA index below/ above median
					IAT D-score (Men)					
Video treatment (=1)	-0.043 (0.078)	-0.022 (0.081)	-0.052 (0.085)	-0.040 (0.089)	-0.055 (0.077)	-0.031 (0.080)	0.001 (0.064)	0.018 (0.064)	-0.109 (0.104)	-0.101 (0.102)
Continuous variable	-0.141 (0.116)	-0.179 (0.116)					-0.035 (0.048)	-0.040 (0.050)		
Treatment × Cont. variable	0.174 (0.166)	0.146 (0.172)					0.105 (0.065)	0.103 (0.066)		
Above median (Ref. below/equal)			-0.138 (0.091)	-0.180* (0.097)					-0.083 (0.104)	-0.086 (0.108)
Treatment × Above median			0.110 (0.124)	0.116 (0.131)					0.206 (0.134)	0.224* (0.135)
2-4 statements (Ref. 0-1)					-0.159 (0.140)	-0.268* (0.146)				
5-6 statements (Ref. 0-1)					-0.129 (0.111)	-0.160 (0.107)				
Treatment × 2-4					0.217 (0.180)	0.209 (0.182)				
Treatment × 5-6					0.177 (0.162)	0.172 (0.169)				
Constant	0.114* (0.058)	-0.357 (0.431)	0.140** (0.065)	-0.280 (0.446)	0.118** (0.057)	-0.383 (0.420)	0.082* (0.048)	-0.427 (0.409)	0.127 (0.086)	-0.361 (0.420)
Controls	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
No. of observations	214	214	214	214	214	214	214	214	214	214
Adjusted R-squared	-0.007	0.008	-0.003	0.017	-0.013	0.007	0.001	0.012	0.000	0.016

Note: OLS estimates with robust clustered standard errors in parentheses; standard errors are clustered at the HH-level. Further controls include age category (18-30 years), marital status, level of education, occupational status in past 12 months, migration status (to EU or North American country), location of HH (rural, governorate on coast) and interviewer characteristics (gender and perceived religiosity). "Agreeing" with none (=0) of the statements reflect progressive norms, whereas "agreeing" with a high number of statements represents conservative norms. The MCA index uses the first dimension; higher values reflect more conservative norms. *** indicates significance at 1%, ** at 5%, and * at 10%.

Table E.4: Impact of video treatment on IAT D-scores by explicit attitudes on domestic violence using alternative measures, female sample

Domestic violence	IAT D-score (Women)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Share of statements "agreeing"		Share below/ above median		Alternative categories		MCA index		MCA index below/ above median	MCA index below median
Video treatment (=1)	-0.024	-0.024	-0.001	-0.006	-0.019	-0.019	-0.033	-0.026	0.065	0.065
	(0.073)	(0.079)	(0.076)	(0.079)	(0.074)	(0.079)	(0.068)	(0.073)	(0.090)	(0.095)
Continuous variable	0.024	0.007					0.041	0.042		
	(0.110)	(0.115)					(0.043)	(0.047)		
Treatment × Cont. variable	-0.083	-0.051					-0.042	-0.031		
	(0.208)	(0.209)					(0.071)	(0.074)		
Above median			0.088	0.072					0.167*	0.174*
(Ref. below/equal)			(0.094)	(0.098)					(0.094)	(0.101)
Treatment × Above median			-0.104	-0.074					-0.197	-0.185
			(0.154)	(0.155)					(0.136)	(0.142)
2-4 statements					0.093	0.037				
(Ref. 0-1)					(0.155)	(0.177)				
5-6 statements					-0.016	-0.023				
(Ref. 0-1)					(0.105)	(0.110)				
Treatment × 2-4					-0.419*	-0.350				
					(0.245)	(0.261)				
Treatment × 5-6					0.000	0.016				
					(0.207)	(0.207)				
Constant	-0.020	0.094	-0.049	0.073	-0.017	0.081	-0.020	0.096	-0.109	-0.017
	(0.058)	(0.140)	(0.061)	(0.140)	(0.059)	(0.143)	(0.047)	(0.133)	(0.075)	(0.150)
Controls	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
No. of observations	185	185	185	185	185	185	185	185	185	185
Adjusted R-squared	-0.013	-0.058	-0.01	-0.056	-0.008	-0.056	-0.009	-0.054	0.004	-0.041

Note: OLS estimates with robust clustered standard errors; standard errors in parentheses; standard errors are clustered at the HH-level. Further controls include age category (18-30 years), marital status, level of education, occupational status in past 12 months, migration status (to EU or North American country), location of HH (rural, governorate on coast) and interviewer characteristics (gender and perceived religiosity). "Agreeing" with none (=0) of the statements reflect progressive norms, whereas "agreeing" with a high number of statements represents conservative norms. *** indicates significance at 1%, ** at 5%, and * at 10%. The MCA index uses the first dimension; higher values reflect more conservative norms.

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