Putting Things in Context:

Effect of Contextual Information on Survey Responses

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Abstract:

Bias in survey questions comes from a variety of sources – one of which is the information provided to question text informing respondents as they answer a given question. Schuman, Presser, & Ludwig (1981) found that the way in which the question is framed is indeed influential. In this study, we attempt to test this idea by randomly assigning contextual information to one of four distinct, low salience topics under four different framings - no context, neutral context, positive context, and negative context.

Our findings strengthen previous research that demonstrated how contextual information in questions creates measurable impacts on survey results. Interestingly, we found that context of any kind, regardless of type of bias, increases support in varying degrees. When negative context was provided, support increased by an average of 6 percentage points, in comparison to increasing opposition only by 2 points. One of our most striking findings was the higher magnitude of change in support among those aged over 50 than those aged under 50 To illustrate, neutral context increased support by 33% for 50–64-year-olds and 31% 65+ year-olds, compared to 19% for 18-34-year-olds and 15% for 35–49-year-olds. We contribute to the field of survey research through our detailed discussion on how contexts affect how respondents change their answering behavior.

Contents

1. Introduction & Background

Online surveys are an effective way to collect data, but one persistent source of bias is derived from how questions are asked. Specifically, it is unclear as to whether context or background information should be provided to the respondent, and if so, how much and what information to provide, before they answer the question of interest. Providing too much context or misleading information may influence the respondent's decision, while providing too little may obscure the intent of the question and create statistical noise. According to Tourangeau, Rips, & Rasinski (2000) people go through a four-step process when answering survey questions: comprehension, retrieval, judgement, and response. The decision by the researcher to provide context or not will directly impact comprehension and retrieval, which will lead to changes in judgement and ultimately response.

Survey questions are either factual or attitudinal. With attitudinal questions, it is difficult to decide what an "accurate" response is. Consequentially, these questions are prone to response effects. Therefore, the decision to include information is not value neutral and it is imperative that survey designers understand the implications of their decision. Schuman, Presser, and Ludwig (1981) reveal this through finding contrasting responses to the issue of abortion in two surveys, where in one survey the question is asked after a similar question regarding abortion in the case of birth defect. This study is often cited as basis for displaying how context can affect survey response.

Our study attempts to further explore this dynamic by analyzing it in a different setting. First, we suppose that a significant number of survey responders in a random sample have predetermined thoughts or beliefs about common contentious issues such as abortion. In Schuman, Presser, and Ludwig's study, if these ideas were a factor in how much people were swayed by the context, then we have reason to believe that the degree in which people can be swayed can vary depending on the topic. Second, prompting respondents to answer a related specific question before the general question at hand introduces a part-whole question order bias, in which if the specific item is asked before the general item, respondents will answer differently compared to when general item is asked before the specific item. Our study intends to eliminate these effects by asking about a topic that is generally less known and controversial, and asking each respondent only a single question. Furthermore, we deliberately introduce the notion of "positivity" and "negativity" into the context, to see if there are meaningful differences between them.

This leads to our research question: If we provide context in a single survey question, one that may influence the survey responder's mental processing of relevant information, then is it possible to change how the respondent will answer the question? Our study discusses the effect of providing pre-question information on survey takers' responses by presenting results across a range of issues, spanning both commercial and political topics, and by eliminating the question order effect in Schuman, Presser, and Ludwig's study. Through a series of large survey experiments we seek to validate the scholarly consensus on the effect of contextual

information on survey takers, specifically within online polls. This is intended to add to the literature on the impact of contextual information in surveys by further illustrating the range of effects and provide valuable information for helping decide the appropriate level of context.

Before moving into the methodology of our experiment, it is important to outline some of the existing literature underpinning established theories in survey methodology. Firstly, as previously mentioned, Schuman, Presser, and Ludwig proved contextual information can affect a respondent's answers, which has been validated repeatedly by similar studies (Schuman, Kalton, & Ludwig, 1983; Schuman & Presser, 1981; Schwarz, Groves, & Schuman, 1998). Lavrakas (2008) illustrated the dynamic of priming, whereby "previous activation of one type of information in active memory affects the processing of subsequent related information." This can occur either through previous questions priming a respondent, or when the framing or wording of a question prompts the respondent to associate the question with another issue. This influence was further highlighted by Tanur (2015), who showed contextual effects can occur when prior questions influence how a respondent considers an answer. Research into opinion polls have repeatedly found that when respondents (Schwarz, Groves, & Schuman, 1998) are exposed to a particular framing or context, they shift their opinions towards the direction of the context (Chong & Druckman, 2007; Druckman, Fein, & Leeper, 2012). We seek to gain deeper insight into how these theories hold up in the emerging field of digital survey research.

A secondary purpose of our study is borne out of challenges to public polling that arose in the 1990s, due to increasing nonresponse rates to telephone random digit dialing surveys. As political scientist Adam Berinsky described, "The modern polling landscape is the Wild West, in need of a sheriff to bring order" (2017, p. 315). To a certain extent, online polls have become that antidote capturing adequate sample to mitigate against telephone nonresponse rates. However, online surveys have not been studied with the same rigor nor had the same development of collective data practices as other traditional polling methods. As such, this experiment is designed to test conventional wisdom derived from established survey methods (i.e., telephone and in-person polls) on the less established method of online surveys.

2. Methodology

The survey was conducted online within the United States from March 21 - April 1 among 12,053 adults by HarrisX. We used the HarrisX Overnight Poll (HOP), which is a survey fielded 365 days a year, collecting ~1,000 US adults and ~1,000 voters within a 24-hour turnaround time.[1] The sampling margin of error (MOE) of this poll is $\pm$ 0.9 percentage points. In order to reflect a nationally representative sample of U.S. adults, results were weighted for age by gender, region, race/ethnicity, and income where necessary to align them with their actual proportions in the population.

[1] For more information, see: https://insights.harrisx.com/abouthop

This experiment was designed to understand and measure how context in survey questions influences a respondent's attitudinal response to proposed survey questions and the magnitude that it influences a respondent's decision. Schwarz, Groves, & Schuman (1998) and Schuman & Presser (1981) show that even minor changes in question wording can lead to significant changes in respondents' answers; however, the measurement of interest is the impact of different contexts on respondent attitude rather than the variation derived from altering text or changing the framing of the issue. As such, we conducted a four-way randomized split among respondents asking whether they support, oppose or are unsure about an issue accompanied by no, neutral, positive, or negative context. To avoid bias related to partisan affiliation, four low salience topics were chosen. These topics are familiar to the average respondent but would generally still require context The four issues are the General Data Protection Regulation (GDPR) – Test A, the 2015 Iran Nuclear Deal – Test B, plant-based meat – Test C, and blockchain regulation – Test D[2]. These randomized splits were designed to measure the impact of context on an individual's comprehension of an issue and how that impacts judgment against the control group which was provided no context. As shown by Schuman & Presser (1981), this constitutes a legitimate balance as the alternative responses are formal opposites – "support" or "oppose."

Context effects can occur when the preceding questions prompt bias or influence thinking, in that prior questions can impact what information respondent retrieves before they make a judgement (Tanur, 2015). To address this effect, each survey question was placed in the same location in the survey, which was after a standard set of preliminary demographic questions such as gender, income, education level, race, and age. By ensuring no questions that related to the four topics were included before the respondent was served their split, and that question was served in an identical location within the survey, it helped mitigates against the context effect of preceding question. Furthermore, by splitting respondents into four randomized and similarly sized groups, we were able to ensure no socio-economic traits were overrepresented among a particular question split. Additionally, we aimed to provide even degrees of positivity and negativity among the question splits to make sure they provided similar magnitudes of influence.

There are several limitations and shortfalls that resulted from our experiment. One is the use of words that could be perceived as "loaded" or "political" that could have impacted cognitive schemata by eliciting strong associations with separate issues (Tourangeau & Rasinski, 1988). Instances that could elicit associations such as this and thus influence a respondent's answer include references to Presidents Donald Trump and Barack Obama as well as climate change which all could cause negative or positive associations outside the substance of the actual question.[3] With that, we acknowledge that each of the four tests vary in its language, which may factor into the behaviors in survey takers. It perhaps is impossible to equally weight

[2] For the full question wording, please see the appendix.

[3] We believe this does occur in our results, and more is discussed in detail in the findings section.

the “positive” and “negative” contexts in the questions, and even small differences in wordings between different tests may convey minor differences absent in this study. As an example, Test A asks what people think about the topic “in general” in all four variations. However, in Test B, such wording is not present. An outlier in our results was Test C, where in framing the question the answer choices included a prompt to explain which side of the issue was in support of the bias and which was in opposition.

A second limitation is using a four-way randomized split instead of asking all respondents a question with no context and measuring the impact of the three types of information by measuring the delta among a three-way split. Additionally, Schuman and Presser (1981) illustrated that many survey respondents choose alternative answers to opinion question even when they do in fact have an opinion. It could have been fruitful to include a “no opinion” answer in addition to don’t know to mitigate this survey design effect.

3. Results

3.1 Key Findings

Table 1. Showing the responses of four variations of four tests

Question		Context addressed			
		No Context	*Neutral*	*Positive*	*Negative*
GDPR	Support	45%	**69%**	**66%**	**60%**
	Oppose	9%	7%	7%	11%
	Don't know/Unsure	46%	**25%**	**27%**	**29%**
	Population	1265	1259	1263	1233
Iran Nuclear Deal	Support	41%	**54%**	**53%**	**45%**
	Oppose	26%	**20%**	25%	26%
	Don't know/Unsure	33%	**25%**	**23%**	29%
	Population	1265	1245	1240	1270
Plant Based Meats	Support	32%	35%	33%	29%
	Oppose	25%	28%	27%	**32%**
	Don't know/Unsure	42%	38%	40%	39%
	Population	1230	1254	1272	1273
Blockchain Regulation	Support	28%	**41%**	**40%**	**37%**
	Oppose	21%	21%	22%	22%
	Don't know/Unsure	50%	**38%**	**38%**	**41%**
	Population	1212	1268	1286	1264

**__Bold__ indicates statistical significance (p<0.05) compared to ‘No Context’*

Table 2. Change in response from No Context question to the three different contexts in Test A – GDPR

Context	*Neutral*	*Positive*	*Negative*
Support	**24%**	**22%**	**15%**
Oppose	-3%	-3%	2%
Don't know/Unsure	**-21%**	**-19%**	**-17%**
Population	2524	2528	2498

***Bold** indicates statistical significance (p<0.05) compared to 'No Context'*

Table 3. Change in response from No Context question to the three different contexts in Test B – Iran Nuclear Deal

Context	*Neutral*	*Positive*	*Negative*
Support	**13%**	**12%**	4%
Oppose	**-6%**	-1%	0%
Don't know/Unsure	**-8%**	**-10%**	-4%
Population	2510	2505	2535

***Bold** indicates statistical significance (p<0.05) compared to 'No Context'*

Table 4. Change in response from No Context question to the three different contexts in Test C – Plant Based Meat

Context	*Neutral*	*Positive*	*Negative*
Support	3%	1%	-3%
Oppose	2%	2%	**7%**
Don't know/Unsure	-5%	-2%	-3%
Population	2484	2502	2503

***Bold** indicates statistical significance (p<0.05) compared to 'No Context'*

Table 5. Change in response from No Context question to the three different contexts in Test D – Blockchain Regulation

Context	*Neutral*	*Positive*	*Negative*
Support	**13%**	**12%**	**9%**
Oppose	-1%	1%	1%
Don't know/Unsure	**-12%**	**-12%**	**-10%**
Population	2480	2498	2476

***Bold** indicates statistical significance (p<0.05) compared to 'No Context'*

Table 6. Tests A-D – Average of changes across four questions

Context	*Neutral*	*Positive*	*Negative*
Support	**13%**	**11%**	**6%**
Oppose	-2%	-1%	**2%**
Don't know/Unsure	**-12%**	**-11%**	**-9%**
Population	7028	7026	7026

***Bold** indicates statistical significance (p<0.05) compared to 'No Context'*

Averaging the changes across our tests give us a good understanding of how context impacts survey response. As shown in Table 1, when no context is given, the proportion of those answering “Don’t know/Unsure” is 46%, 33%, 42%, 50% for Tests A-D respectively. The result of the survey tells us that introducing context of any kind attenuates the percentage by between 9 to 12% on average across the four tests (Table 6). Our hypothesis was that if we introduce neutral, positive, and negative contextual information, 9-12% of responders would be 1) equally distributed among “Support” and “Oppose” for those that saw neutral context, 2) distributed favoring towards “Support” for those that saw positive context, and 3) distributed favoring towards “Oppose” for those that saw negative context. The overall results shows that we were only partially correct.

On aggregate, neutral, or bilateral, context increased “Support” by 13%. Considering that “Don’t know/Unsure” decreased by 12%, this increase is much higher than we expected. In fact, we find that “Oppose” decreased by 2%, albeit this alone has no statistical significance. This suggests that providing non-biased informational context has a net positive effect on what people believe. Furthermore, this effect is even greater than when we explicitly display positive context. When we provide positively skewing information before the question, “Support” grew by 11%. Even though there is no outright bias, people appear to treat neutral information almost equally to positive information.

All four tests show similar trends. In Test A, B, and D, the aforementioned distribution in data is definite. Neutral context increases support by 24% in Test A, 13% in B, and 13% in D. Even though context does not contain obvious bias, opposition decreased or showed no statistically significant change. Similarly, positive context increased support by 22% in Test A, 12% in B, and 12% in D. Increases in support among those who saw neutral context was larger than those who saw positive context, suggesting respondents may be cognizant of the bias and thus see the questions with outright positive bias less auspiciously. Test C was less evident. In this test, any context did not significantly decrease those who answered “Don’t know/Unsure”. As a result, the proportion of those who support or oppose did not change by much in neither neutral nor positive context.

However, the impact of negative context is more puzzling. On aggregate, giving respondents negatively biased contextual information reduces the proportion of “Don’t know/Unsure” by 9%, which is less than when we provided neutral or positive information. Remarkably, of those 9%, only 2% is distributed to “Oppose”, while 6% is distributed to “Support”. Many respondents were not influenced by purposely misleading them to disagree with the question at hand. Instead, a majority have taken an opposite view and chose to support the prompt. From this result, we can deduce that many respondents who read negative contextual information are unlikely to convert to opposition stance, but instead are more likely to be persuaded to support by it. In fact, any kind of context fails to achieve the survey maker’s goal of negatively swaying the audience. Test C was an exception, as opposition actually increased as negative context was introduced, albeit at a less degree than we expected.

3.2 Demographic Differences

Next, the question arose as to whether different demographic groups were more susceptible to persuasion based on context. Research has found that adding demographic questions to surveys yields no substantive or significant differences to survey response rate (Ziegenfuss, et al., 2021). Patterns between groups of interest can help paint a more detailed picture about the varying magnitude of effects of contextual information on different populations. To identify the differences between key demographic groups, the following section looks at the average change across the four tests between support, opposition and don't know/unsure based on the difference between no context and the three control splits. The average of the change in Support/Oppose/Don't Know is measured by those who select the response in within the context (neutral, positive, or negative) subtracted from those who selected the response when provided no context. The study focuses on four key demographic groups to illustrate the sub-group differences: gender, age, race and education. The results of our logit regression model underpin these to be the most impactful variables and thus the most worthy of further analysis.

Age Groups

Table 7. change in response from No Context question to the three different contexts

Context	*Neutral*				*Positive*				*Negative*			
	18-34	*35-49*	*50-64*	*65+*	*18-34*	*35-49*	*50-64*	*65+*	*18-34*	*35-49*	*50-64*	*65+*
Support	15%	19%	33%	31%	9%	20%	31%	29%	11%	14%	20%	17%
Oppose	-4%	0%	-4%	-2%	-3%	-5%	0%	-3%	-2%	4%	5%	1%
Don't know/Unsure	-10%	-19%	-29%	-28%	-6%	-16%	-30%	-25%	-9%	-18%	-25%	-18%
Population	2017	2204	1546	1261	2058	2181	1515	1273	2042	2191	1522	1271

Across the board, there is a clear divide between those under and those above 50 years old. Providing neutral context saw a 33% and 31% increase in support for those aged 50-64 and 65+, respectively. This was a larger increase in support than even the positive context, which increased support by 31% (50–64-year-olds) and 29% (65+ year-olds). In comparison, support for 35–49-year-olds increased 19% with the neutral context and 15% for 18–34-year-olds. Consistent with the overall trends, most of the increase in support came at the expense of those selecting "Don't know/Unsure" over those selecting "Oppose". Similarly, the negative context created less movement relative to the neutral and positive context.

It is possible that the topics cover more recent issues that could be more familiar to younger groups. For example, the rise of plant-based meats has only been a recent phenomenon, with companies like Impossible Foods and Beyond Meat only emerging since the 2010s. The GDPR was passed in 2016, Iran Nuclear Deal in 2015 and the blockchain technology was only beginning to be popularized in 2008. This suggests that when surveying topical issues,

the impact of contextual information can be greater among older age groups who are potentially less familiar with the topics.

Gender

Table 8. Change in response from No Context question to the three different contexts

Context	Neutral		Positive		Negative	
	Men	Women	Men	Women	Men	Women
Support	**13%**	**14%**	**10%**	**13%**	4%	**9%**
Oppose	-4%	0%	-2%	1%	0%	**4%**
Don't know/Unsure	**-9%**	**-14%**	**-8%**	**-14%**	-4%	**-13%**
Population	3175	3853	3199	3828	3163	3863

The change in support after neutral context was relatively steady among genders; however, women were +5pts more likely to change their mind from "Don't know/Unsure". This pattern is even more pronounced when bias was introduced into the context, with the positive context leading to a 14-point decline in women selecting they were unsure relative to an 8% drop among men, followed by a 9-point difference with the negative context (women 13% drop, men 4%). These shifts are likely impacted by the larger proportion of women selecting "Don't know/Unsure" in the no context split.

As such, it indicates that the magnitude of influence in a respondent's decision could be greater among women, as potentially men are more likely to have determined their answer prior to receiving contextual information.

Race/Ethnicity

Table 9. Change in response from No Context question to the neutral contexts by race/ethnicity

Context	Neutral				
	White	Black/AA	Hispanic	Asian	Other
Support	**14%**	**11%**	**10%**	**16%**	**17%**
Oppose	0%	-1%	-4%	-5%	-12%
Don't know/Unsure	**-14%**	**-10%**	-6%	-11%	-5%
Population	4936	961	749	231	151

Table 10. Change in response from No Context question to the Positive contexts by race/ethnicity

Context	Positive				
	White	Black/AA	Hispanic	Asian	Other
Support	**12%**	**14%**	7%	8%	19%
Oppose	0%	-3%	1%	-2%	-10%

Don't know/Unsure	**-12%**	**-11%**	-8%	-5%	-9%
Population	4912	992	760	217	146

Table 11. Change in response from No Context question to the negative contexts by race/ethnicity

Context	Negative				
	White	Black/AA	Hispanic	Asian	Other
Support	**7%**	5%	7%	0%	9%
Oppose	2%	3%	2%	0%	8%
Don't know/Unsure	**-9%**	-9%	-9%	1%	-17%
Population	4918	964	763	214	167

Differences in the influence of contextual information between racial and ethnic groups was less pronounced compared to other population subgroups, particularly the age group divisions. White (+14pts), Asian (+16pts), and Other minorities (+17pts) respondents were more likely to increase support following neutral context. Relative to other groups, Black and Hispanic respondents showed less movement with the neutral and negative context. This indicates that the magnitude of contextual influence is less correlated between racial and ethnic groups relative to other demographic groups.

Education

Table 12. Change in response from No Context question to the neutral contexts by education level

Context	Neutral		
	Less than high school degree	High school degree to less than 4-year	4-year college degree or more
Support	**12%**	**15%**	**12%**
Oppose	-1%	-2%	-2%
Don't know/Unsure	**-10%**	**-13%**	**-10%**
Population	2428	2447	2153

Table 13. Change in response from No Context question to the positive contexts by education level

Context	Positive		
	Less than high school degree	High school degree to less than 4-year	4-year college degree or more
Support	**11%**	**13%**	**10%**
Oppose	0%	-1%	0%
Don't know/Unsure	**-11%**	**-12%**	**-10%**
Population	2407	2455	2165

Table 14. Change in response from No Context question to the negative contexts by education level

Context	Negative		
	Less than high school degree	*High school degree to less than 4-year*	*4-year college degree or more*
Support	**25%**	**7%**	0%
Oppose	-5%	0%	0%
Don't know/Unsure	**-20%**	**-8%**	1%
Population	795	885	828

When it comes to education, there is less variation between the sub-groups. For both the neutral positive context, there is no more than +/- 3-points change in support, opposition or being unsure from the no context question. One interesting finding is the impact of the negative context. For those with less than a high school education, there was a 14% increase in support, 10-points higher than those with a 4-year college degree or more (who only shifted in support 4%).

Digging deeper into the data, the negative context from Test B, the Iran Nuclear Deal (Table 15) revealed the greatest difference in influencing survey respondents of different educational status. Interestingly, among those with less than a high school degree, "Support" for the deal grew +25 points and + 7 points among those with a high school to less than a 4-year college degree when negative context was provided, compared with no movement with higher educated respondents.

Table 15. Change in response from No Context question to the Negative context for Iran Nuclear Deal

Context	Negative		
	Less than high school degree	*High school degree to less than 4-year*	*4-year college degree or more*
Support	**25%**	**7%**	0%
Oppose	-5%	0%	0%
Don't know/Unsure	-20%	**-8%**	1%
Population	*795*	*885*	*828*

One potential cause is that as the questions directly refer to political figures, with the positive-biased context describing President Obama reaching a "historic understanding" with Iran, while the negative-biased context referred to President Trump's 2015 withdrawal from the deal, triggering partisan reactions. It is plausible that the correlation between education and party identification, whereby Republicans skew lower education and Democrats skew higher education influenced these results. Table 16 validates this claim, demonstrating that higher education (4-year college degree or more) is correlated with Democrats while Republicans are correlated with less than a college degree.

Relationship Between Education and Party ID

Table 16. Change in response from No Context question to the Negative context for Iran Nuclear Deal

Party ID vs Education	*Republican*	*Democrat*	*Independent*	*Other*
Less than high school degree	5%	4%	7%	17%
Column comparisons			*a B*	*A B C*
High school degree to less than 4-year	59%	49%	59%	61%
Column comparisons	*B*		*B*	*B*
4-year college degree or more	37%	48%	34%	22%
Column comparisons	*D*	*A C D*	*D*	
Population	*3136*	*4026*	*2398*	*488*
Column Names	*A*	*B*	*C*	*D*

**Column comparisons indicates statistical significance (p<0.05)*

These findings fit neatly with well-established norms in political science and social psychology that when partisan cues are included, respondents who already have firmly held views can make quicker judgements (Slothuus & de Vreese, 2010). Research has shown that there is a heavy link between issue framing in polls and motivated reasoning, in that biased responses become "more pronounced on issues at the center of party conflicts" (Slothuus & de Vreese, 2010, p. 630). As such, when contextual information refers to partisan topics, partisans typically avoid information that could cause "mental discomfort" (Acharya, Blackwell, & Sen, 2018). Using Tourangeau, Rips, & Rasinski (2000)'s four step process, when given a partisan cue, respondents do not go through the same conscious retrieval or judgement of information but can skip to a response that fits in their prior partisan beliefs. Considering this, survey writers should understand the impact of how framing questions that use any political references or language can have significant impact on survey responses. Questions that political terms can act as shorthand's to activate pre-conceived judgements that align with their partisan leanings.

4. Implications and Conclusions

While our study validates Schuman, Presser, and Ludwig's conclusion that the placement of contextual information can affect survey response, there are meaningful differences when we consider the range of effects in the four variations of context. There are four major findings from the results of our study:

1. For low salience issues, context of any kind (positive, negative, or neutral) decreases those who say they "Don't know/Unsure". Moreover, this decrease is mostly followed by an increase in support.

2. While all three variations increase support, positive and neutral contexts increase it by a similar amount.

3. Negative context increases opposition but to a lesser degree than it increases support. Therefore, providing no context may be a preferred option.

4. Contextual information influences subgroups unevenly. The most pronounced was a significantly higher magnitude of change in support among those aged over 50 than those aged under 50.

These four findings show that there are definite ways to influence the answering behavior of survey respondents, depending on how the survey designer writes the survey question. Based on the intent of the survey, the survey writer's method of providing contextual information can change. By introducing the "Unsure/Don't know" answer choice, a surprising contradiction to the established understanding that respondents shift their opinion in the direction of the context (Chong & Druckman, 2007); rather our results showed that providing context to low salience issues, regardless of the context's directional bias, generally increased support for the issue.

If the writer seeks to increase support of the issue at hand, then they will most likely get the most desirable outcome by providing neutral or informational context. Neutral and positive contexts have no statistical significance from each other. On the other hand, if the intention is to increase opposition, then the survey writer can either provide negative context or no context. While negative context increases opposition in absolute number, no context has higher proportion of opposition, and thus, may be a better option in relative terms. Having said, the purpose of data gathering through survey is usually to obtain the most reliable and unbiased information about the attitudes of the survey respondents. It is up to the survey maker's discretion to employ the tactics in these results when writing their survey. After all, this study may well inform the survey writer on what not to do, rather than what they should do.

These results also warrant further research on the behaviors of survey respondents. Why are people answering the way they do? First it is unclear why directly biased context does not have the intended extreme result. Neutral context increases support equally as much as does positive context. Also, negative context does not increase opposition as much as it does support. According to Watson (1992) there is a tendency to respond optimistically by nature, due to acquiescence bias. This may partially explain why increase for support is greater than increase in opposition, but further study needs to be done to account for how the varying degrees of context correlates with this bias. It is also plausible that survey respondents recognize outright bias and purposely avoid "falling into the trap". Finally, it is also possible that there is a factor confusion in the language of the prompt, a limitation we have acknowledged.

Ultimately, regardless of a survey-maker's intention, it is wholly impossible to eliminate bias – bias is introduced just by the words selected to explain an issue. It is critical to recognize that certain prompts will influence results. We have illustrated that providing context will likely illicit greater support for less partisan issues. A strong mitigant comes with greater experience in polling and survey design: recognizing what might influence results, what groups might be

more susceptible, and being skilled in interpreting survey data. Surveys give decision-makers the capability to measure and understand public opinion, empowering a broader swathe of society to have their voice heard; those charged with designing and delivering this information need to account for the impact of contextual information in the polling process.

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6. Appendix

6.1 Test A - General Data Protection Regulation

BASE: SPLIT A
In general, do you support or oppose the US adopting national data privacy laws similar to the European Union's General Data Protection Regulation (GDPR) laws? [REVERSE ROTATE]

1. Support
2. Oppose
3. Don't know/Unsure

BASE: SPLIT B
The General Data Protection Regulation is set of laws that gives EU citizens control over their personal data. It imposes strict legal obligations on how organizations can use, process and store data, and levies heavy fines for companies that fail to protect their customers' data.

In general, do you support or oppose the US adopting national data privacy laws similar to the European Union's General Data Protection Regulation (GDPR) laws? [REVERSE ROTATE]

1. Support
2. Oppose
3. Don't know/Unsure

BASE: SPLIT C
The General Data Protection Regulation is set of laws that gives EU citizens control over their personal data. It imposes strict legal obligations on how organizations can use, process and store data, and levies heavy fines for companies that fail to protect their customers' data.

Even though stricter privacy regulation can impose more cost on business, the GDPR is widely seen as giving individuals more control over their own data, transparency about what businesses do with their data, and trust in how their data is being used.

In general, do you support or oppose the US adopting national data privacy laws similar to the European Union's General Data Protection Regulation (GDPR) laws? [REVERSE ROTATE]

1. Support
2. Oppose
3. Don't know/Unsure

BASE: SPLIT D
The General Data Protection Regulation is set of laws that gives EU citizens control over their personal data. It imposes strict legal obligations on how organizations can use, process and store data, and levies heavy fines for companies that fail to protect their customers' data.

Even though the laws give individuals more control over their data, the GDPR is widely seen as the strictest privacy regulation in the world and can place huge costs on businesses, as well as limit their ability to innovate.

In general, do you support or oppose the US adopting national data privacy laws similar to the European Union's General Data Protection Regulation (GDPR) laws? [REVERSE ROTATE]

1. Support
2. Oppose
3. Don't know/Unsure

6.2 Test B - Iran Nuclear Deal

BASE: SPLIT A
Do you support or oppose the 2015 Iran Nuclear Deal signed by the United States, the UK, Russia, China, and Germany?

1. Support
2. Oppose
3. Don't know/Unsure

BASE: SPLIT B
In 2015, the United States, the UK, Russia, France, China, Germany, and Iran reached a deal where Iran would convert and reduce its nuclear facilities in exchange for ending economic sanctions and freeing up tens of billions in oil revenue and frozen assets.

Do you support or oppose the 2015 Iran Nuclear Deal signed by the United States, the UK, Russia, China, and Germany?

1. Support
2. Oppose
3. Don't know/Unsure

BASE: SPLIT C
In 2015, President Barack Obama reached a "historic understanding" with Iran that halted Iranian development of nuclear fissile material in exchange for sanctions relief. Despite Iran's compliance with

the deal, former President Donald Trump withdrew from the deal in 2018 leading Iran to violate the deal and continue progress on creating a nuclear weapon.

Do you support or oppose the 2015 Iran Nuclear Deal signed by the United States, the UK, Russia, China, and Germany?

1. Support
2. Oppose
3. Don't know/Unsure

BASE: SPLIT D
In 2018, President Donald Trump withdrew from the 2015 Iran Nuclear Deal in response to Iran's continued sponsorship of terrorist groups in the Middle East. President Trump advocated for a new deal of maximum pressure against Iran to both stop their development of nuclear weapons and their state sponsored support of terrorism.

Do you support or oppose the 2015 Iran Nuclear Deal signed by the United States, the UK, Russia, China, and Germany?

1. Support
2. Oppose
3. Don't know/Unsure

6.3 Test C - Plant-Based Meat

BASE: SPLIT A
To help reduce global meat consumption, do you think restaurants and supermarkets should focus on providing more plant-based meat products, like Impossible Foods and Beyond Meat, or do you think they should focus on natural meat alternatives, like beans and tofu?

1. More plant-based meat products, like Impossible Foods and Beyond Meat
2. Natural meat alternatives, like beans and tofu
3. Don't know/Unsure

BASE: SPLIT B
Many scientists have concluded that animal farming and meat production has a significant negative impact on the environment, and to mitigate the worst effects of climate change global meat consumption needs to decrease. Some people think plant-based meats can help those who want to eat meat reduce their consumption, while others have said people can get the nutrients they need from natural produce.

To help reduce global meat consumption, do you think restaurants and supermarkets should focus on providing more plant-based meat products, like Impossible Foods and Beyond Meat, or do you think they should focus on natural meat alternatives, like beans and tofu?

1. More plant-based meat products, like Impossible Foods and Beyond Meat
2. Natural meat alternatives, like beans and tofu

3. Don’t know/Unsure

BASE: SPLIT C
Many scientists have concluded that animal farming and meat production has a significant negative impact on the environment, and to mitigate the worst effects of climate change global meat consumption needs to decrease.

Many nutritionists say that less processed plant produce, like beans and tofu, is a healthy and sustainable solution. However, other experts are promoting plant-based meats are a better solution, as they allow customers to continue to enjoy certain foods without having the same impact on the environment.

To help reduce global meat consumption, do you think restaurants and supermarkets should focus on providing more plant-based meat products, like Impossible Foods and Beyond Meat, or do you think they should focus on natural meat alternatives, like beans and tofu?

1. More plant-based meat products, like Impossible Foods and Beyond Meat
2. Natural meat alternatives, like beans and tofu
3. Don’t know/Unsure

BASE: SPLIT D
Many scientists have concluded that animal farming and meat production has a significant negative impact on the environment, and to mitigate the worst effects of climate change global meat consumption needs to decrease.

While some experts say plant-based meats are a good solution, many nutritionists say “fake” meats still relies on industrial farming practices and are heavily processed so are not healthier. Rather, sticking to less processed plant alternatives, like beans and tofu, is a healthier and more sustainable solution.

To help reduce global meat consumption, do you think restaurants and supermarkets should focus on providing more plant-based meat products, like Impossible Foods and Beyond Meat, or do you think they should focus on natural meat alternatives, like beans and tofu?

1. More plant-based meat products, like Impossible Foods and Beyond Meat
2. Natural meat alternatives, like beans and tofu
3. Don’t know/Unsure

6.4 Test D - Blockchain Regulation

BASE: SPLIT A
In general, do you support or oppose increasing blockchain regulations from the U.S. government?

1. Support
2. Oppose
3. Don’t know/Unsure

BASE: SPLIT B
Blockchain is a digital ledger technology that is most widely known in applications in fast-growing markets such as cryptocurrencies and NFTs. In contrast to a traditional ledger, blockchains allow a transparent transaction in which two parties can enact on a secure transaction without a centralized authority acting as the ledger. All participants of the blockchain network share the record of all transactions. Currently there is debate on whether the United States government should increase its regulations on using blockchain technology.

In general, do you support or oppose increasing blockchain regulations from the U.S. government?

1. Support
2. Oppose
3. Don't know/Unsure

BASE: SPLIT C
Blockchain is a digital ledger technology that is most widely known in applications in fast-growing markets such as cryptocurrencies and NFTs. Blockchain removes a centralized ledger in a transaction, making it risky and vulnerable to scams and frauds. Since there is a lack of infrastructure related to blockchain, many call for increased intervention from the government to build and regulate products and platforms in the blockchain network.

In general, do you support or oppose increasing blockchain regulations from the U.S. government?

1. Support
2. Oppose
3. Don't know/Unsure

BASE: SPLIT D
Blockchain is a digital ledger technology that is most widely known in applications in fast-growing markets such as cryptocurrencies and NFTs. Safely removing the need for a centralized ledger reduces costs and time, helping individuals and small businesses that use blockchain to thrive. Regulations that restrict blockchain may reduce innovation and growth, and it is against the very idea on which the blockchain was built on.

In general, do you support or oppose increasing blockchain regulations from the U.S. government?

1. Support
2. Oppose
3. Don't know/Unsure

6.5 Appendix – Deltas Across All Groups

Average Across 4 Questions from No Context		**Gender**		**Age**			
	Total	Male	Female	18-34	35-49	50-64	65+
Deltas - Neutral Context							
Support	13%	13%	14%	10%	11%	17%	16%
Oppose	-2%	-4%	0%	-3%	-3%	-2%	2%
Don't know/Unsure	-12%	-9%	-14%	-7%	-8%	-15%	-18%
Column Population	7026	3175	3853	2017	2204	1546	1261
Deltas - Positive Context							
Support	11%	10%	13%	7%	11%	14%	15%
Oppose	-1%	-2%	1%	-2%	-1%	2%	0%
Don't know/Unsure	-11%	-8%	-14%	-5%	-10%	-16%	-15%
Column Population	7027	3199	3828	2058	2181	1515	1273
Deltas - Negative Context							
Support	6%	4%	9%	6%	9%	6%	5%
Oppose	2%	0%	4%	0%	2%	4%	3%
Don't know/Unsure	-9%	-4%	-13%	-6%	-11%	-10%	-8%
Column Population	7026	3163	3863	2042	2191	1522	1271

Average Across 4 Questions from No Context	Income						
	Less than $15K	$15K to $35K	$35K to $50K	$50K to $75K	$75K to $100K	$100K +	Decline to answer
Deltas - Neutral Context							
Support	13%	12%	13%	15%	17%	10%	15%

Oppose	-1%	-3%	-2%	-2%	0%	-2%	0%
Don't know/Unsure	-12%	-10%	-11%	-13%	-16%	-8%	-15%
Column Population	984	1779	1007	1141	740	1111	266
Deltas - Positive Context							
Support	13%	13%	10%	12%	15%	9%	11%
Oppose	-2%	0%	-2%	0%	2%	-2%	2%
Don't know/Unsure	-12%	-13%	-9%	-12%	-17%	-7%	-13%
Column Population	977	1757	1012	1189	724	1093	275
Deltas - Negative Context							
Support	11%	8%	7%	3%	12%	3%	8%
Oppose	3%	2%	3%	6%	0%	1%	-3%
Don't know/Unsure	-14%	-10%	-9%	-9%	-12%	-4%	-5%
Column Population	976	1775	993	1153	716	1133	280

Average Across 4 Questions from No Context	Race					Education		
	White	Black AA	Hispanic	Asian	Other	Less than high school degree	High school degree to less than 4-year	4-year college degree or more
Deltas - Neutral Context								
Support	14%	11%	10%	16%	17%	12%	15%	12%
Oppose	0%	-1%	-4%	-5%	-12%	-1%	-2%	-2%
Don't know/Unsure	-14%	-10%	-6%	-11%	-5%	-10%	-13%	-10%
Column Population	4936	961	749	231	151	2428	2447	2153
Deltas - Positive Context								
Support	12%	14%	7%	8%	19%	11%	13%	10%
Oppose	0%	-3%	1%	-2%	-10%	0%	-1%	0%
Don't know/Unsure	-12%	-11%	-8%	-5%	-9%	-11%	-12%	-10%
Column Population	4912	992	760	217	146	2407	2455	2165

Deltas - Negative Context								
Support	7%	5%	7%	0%	9%	14%	8%	4%
Oppose	2%	3%	2%	0%	8%	-2%	3%	1%
Don't know/Unsure	-9%	-9%	-9%	1%	-17%	-13%	-11%	-5%
Column Population	4918	964	763	214	167	2424	2445	2157

Average Across 4 Questions from No Context	Party ID			
	Republican	Democrat	Independent	Other
Deltas - Neutral Context				
Support	15%	11%	14%	11%
Oppose	-3%	0%	-2%	-4%
Don't know/Unsure	-12%	-11%	-12%	-7%
Column Population	2187	2646	1785	410
Deltas - Positive Context				
Support	13%	11%	11%	6%
Oppose	-2%	0%	0%	1%
Don't know/Unsure	-11%	-11%	-11%	-6%
Column Population	2158	2675	1811	383
Deltas - Negative Context				
Support	9%	4%	8%	9%
Oppose	1%	4%	1%	2%
Don't know/Unsure	-10%	-8%	-9%	-11%
Column Population	2132	2674	1813	407