Climate Change or Extreme Weather Events

CLIMATE,
CHANGE
DISASTER

Evaluations of Information from Texas Residents According to Message Framing

EROSIC

LOOD

Climate Change or Extreme Weather Events: Evaluations of Information from Texas Residents According to Message Framing

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Introduction

Providing climate-related information to both policymakers and the public is vital to the efforts to combat climate change. Without public support policymakers may be less inclined to support laws regarding climate change. Furthermore, since policymakers are often elected by the public, candidates that support climate change may not be put in positions to advocate for such measures. This report summarizes the findings of an experimental study performed with Texas residents that sought to better understand the interpretation of climate change messaging.

Study Design

This study was broken down into three parts: assessing message source, assessing message content, and political ideology. Four message conditions were designed to capture the first two parts and included:

- 1. A message from "the federal government" about "climate change"
- 2. A message from "the federal government" about "extreme weather events"
- 3. A message from "a non-profit organization" about "climate change"
- 4. A message from "a non-profit organization" about "extreme weather events"

The message was designed to look like a message that individuals would see on the internet or social media and read as follows:

800 million people are currently vulnerable to climate change impacts.

According to a recent report, released by the federal government, eleven percent of the world's population is currently vulnerable to climate change impacts such as droughts, floods, heat waves, severe storms, and sea-level rise.

This message is an illustration of the first message condition. For the remaining conditions "the federal government" was replaced with "a non-profit organization" and "climate change" was replaced with "extreme weather events". Participants were then asked to rate the message on message credibility (Appleman & Sundar, 2015) and newsworthiness (Mayo & Leshner, 2000). Participants were also asked to complete the conservatism – liberalism scale (Mehrabian, 1996) and provide demographic information. Results were then analyzed to see which content (i.e., climate change or extreme weather events) was rated more favorably, which source of information (i.e.,

federal government or non-profit organization) was rated more approvingly, and then examining the role political ideology played in participant ratings.

Study Recruitment

After Institutional Review Board (IRB) approval, participants were recruited from Amazon's Mechanical Turk, or MTurk, service. Participants who successfully completed the survey were paid \$2.00 for their participation. Texas was selected as the study domain since it constitutes the largest state in the SCIPP region both by area and population, and experiences hazards common throughout the SCIPP region.

Participant Demographics

Participants (N=376) reported racial or ethnic identities of American Indian or Indigenous People (n=2,0.5%), Asian (n=20,5.4%), Black (n=37,9.8%), Latina/o/x (n=11,3.0%), Pacific Islander or Native Hawaiian (n=1,0.3%), White (n=225,61.1%), or more than one racial/ethnic identity (n=72,19.6%). Participants lived in South Texas (n=151,40.8%), North Texas (n=118,31.9%), East Texas (n=69,18.6%), and West Texas (n=32,8.6%). Regarding higher education, 52.4% of participants reported less than bachelor's degree. Biological sex was mostly split between women (n=185,49.2%) and men (n=184,48.9%) with the remaining participants who answered the question identifying as undetermined (n=2,0.5%). Most participants (79.1%) reported their household income was less than \$80,000. The average age of participants was 38.35 (SD=12.48) and ranged from 18 to 81.

Study Measures

Participants were asked to rank the message they read on two different scales and to provide their political orientation on a third scale. All scales were rated with 1-5 Likert style answers.

The first scale was the message credibility scale developed by Appleman and Sundar (2015). The higher the score on this scale the more credible a participant believes the message to be. The average score on this scale was 3.60 (SD = 0.82).

The second scale was the newsworthiness scale developed by Mayo and Leshner (2000). The higher the score on this scale the more newsworthy a message is considered to be. The average score on this scale was 3.90 (SD = 0.82).

Finally, participants were asked about their political ideology using the conservatism to liberalism scale of Mehrabian (1996). A lower score on this scale represents a more conservative view and a higher score a more liberal view. The average score on this scale was 3.07 (SD = 1.08) which was, notably, at the scales center.

Study Results

All tests were performed in IBM's SPSS statistical package.

Evaluation of Source

The first tests compared the responses to messages from the federal government against messages from a non-profit organization.

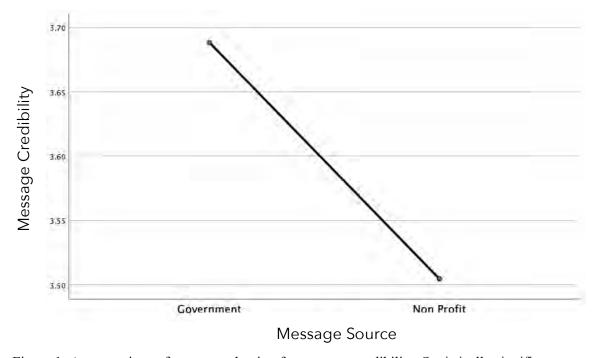


Figure 1: A comparison of source evaluation for message credibility. Statistically significant at p < .05.

As shown above, messages that were presented as governmental were rated more favorably than messages from non-profit organizations, and this difference was significant at p < .05.

Regarding newsworthiness, messages from the government were rated more favorably, but not at a statistical level of significance.

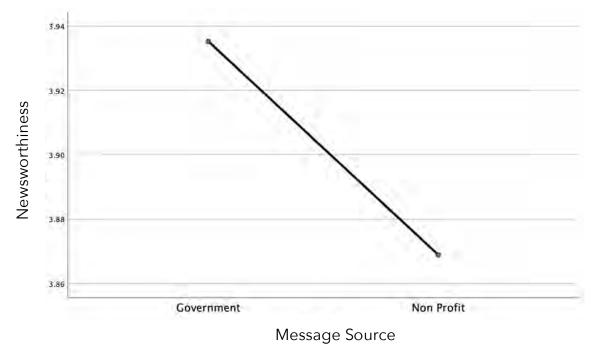


Figure 2: A comparison of source evaluation for newsworthiness. Not statistically significant at p > .05.

It is concluded that Texas residents perceived governmental messages more credibly, but that all messages were considered newsworthy as the average response for both types of messages were above 3.0, the midpoint of the scale.

Evaluation of Message

To manipulate the message either the words climate change or extreme weather event were changed.

Participants rated, at a statistically significant level (p < .05), messages worded as climate change as less credible than those worded as extreme weather events. However, no significant difference was noted in newsworthiness between the two conditions. These findings are illustrated in the figures below.

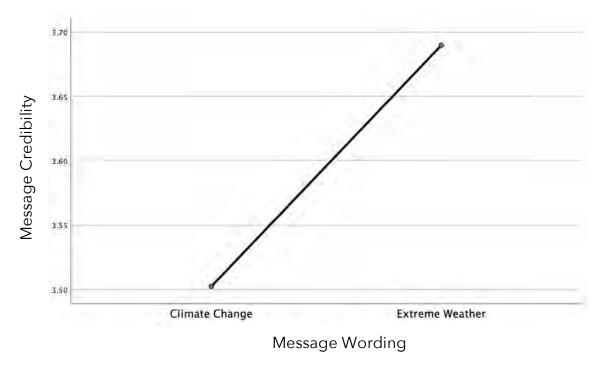


Figure 3: A comparison of message evaluation for credibility. Statistically significant at p < .05.



Figure 4: A comparison of message evaluation for newsworthiness. Not statistically significant at p > .05. Similar to the source results, participants rated extreme weather messages significantly better for credibility, but no significant differences were found for newsworthiness.

As a final step in this analysis, all conditions were compared for both message credibility and newsworthiness. Unsurprisingly, no significant differences were noted regarding newsworthiness. However, the overall test of message credibility was statistically significant (p < .05) and post-hoc analyses revealed that this difference lay largely between the extreme weather government and climate change nonprofit conditions (p < .01), as illustrated in the figure below.

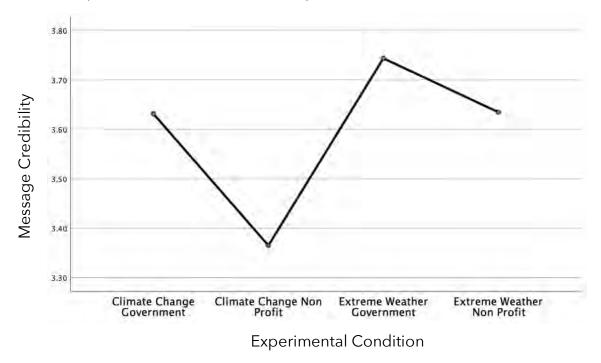


Figure 5: A comparison of all conditions for message credibility. Statistically significant at p < .05.

These results indicate that the most effective way to present information on climate change is to a) provide it from a governmental source and b) frame it as extreme weather events. Although climate change is a more accurate term for the phenomenon that is being explained, lay individuals may have a preconceived idea of climate change information as misleading, lacking credibility, or even false. Therefore, if the goal is to raise public awareness about climate change then perhaps it would be more beneficial to package such information in terms of extreme weather events.

It must be acknowledged, however, that climate change has become a politicized issue. In order to see just how politicized it has become, political ideology was included in additional analyses.

Evaluations Considering Political Ideology

The first analysis conducted was a correlational analysis of political ideology and other continuous and demographic variables.

Variable	1	2	3	4	5	6
1 Political Ideology						
2 Message Credibility	253***					
3 Newsworthiness	309***	.687***				
4 Age	.234***	093	119 [*]			
5 Education	.016	027	079	.058		
6 Biological Sex [^]	037	.010	.027	.050	158**	
7 Income	.176***	090	090	.090	.330***	071

Table 1: Correlations of political ideology and other study variables. Note: $^{\land}$ Man = 0 and Woman = 1. * = p < .05, ** = p < .01, *** = p < .001.

Political ideology was found to be negatively related with both message credibility and newsworthiness, in the overall sample, and therefore further tests controlling for political ideology were warranted. This relationship indicates that the more conservative a participant's political ideology was the lower they scored messages for both credibility and newsworthiness. Notably, the only other demographic factor tested here which had a significant relationship with either credibility or newsworthiness was age. The older an individual was the lower they rated messages as newsworthy.

For these reasons, both message credibility and newsworthiness were tested for all conditions. Furthermore, age and political ideology were controlled for as covariates and the results of these analyses are presented below.

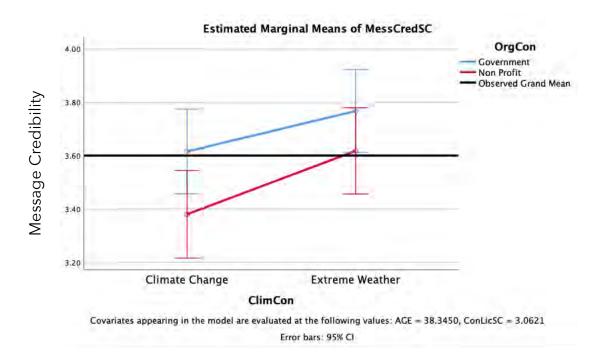


Figure 6: MANCOVA (an analysis of multiple variables that also controls for possible alternative explanations) of all conditions for message credibility controlling for age and political ideology. Statistically significant at p < .05.

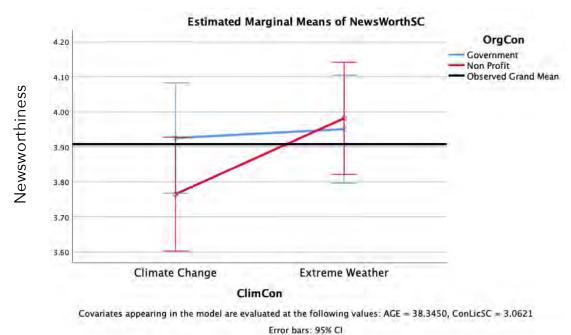


Figure 7: MANCOVA (an analysis of multiple variables that also controls for possible alternative explanations) of all conditions for newsworthiness controlling for age and political ideology. Statistically significant at p < .05.

As seen in the figures above, significant relationships were still found for message credibility even when controlling for age and political ideology.

Additionally, no significant differences were found for, newsworthiness and Figure 7 may provide some evidence as to why. When age and political ideation are controlled for an interaction effect is noted for organizational type and extreme weather. This indicates that the age of the audience must be taken into account when crafting a message about climate change.

Conclusion

The results of this project provide some key takeaways for interpreting research on climate change for lay individuals, or in this case residents of Texas. There are four strategies that SCIPP, and other climate change communicators, could implement when providing information to better educate the public.

- 1. The phrase climate change is divisive and causes messages to appear less credible. Alternative phrases, when scientifically appropriate, might be warranted to increase the chance of public audiences accepting the message.
- 2. Messages presented from non-profit organizations are rated as less reliable than messages from the federal government. When providing information, it might be helpful to use the logos of funding agencies or government partners.
- 3. The more conservative the participants were, the lower they rated all messages on credibility and newsworthiness. Therefore, when interacting in areas that are known to be more conservative, messaging efforts that follow items 1 and 2 above may be more successful.
- 4. Older participants did not find messages to be as newsworthy as younger participants. Knowing the audience is key. If the audience is older, more effort may be required to get them to buy into the information presented.

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Copies have not been printed but are available through the SCIPP website.

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Appendix: Survey Questions

SCIPP Climate Change vs Severe Weather - Projects Contacts Actions Library Help

Survey Actions Distributions Data & Analysis Reports

SCIPP Climate Change vs Severe Weather

iQ Score: Fair Published

▼ Informed Consent Block

Block Options ~



Unsigned Consent to Participate in Research



Would you like to be involved in research at the University of Oklahoma? I am William Howe from the Oklahoma Climatological Survey and I invite you to participate in my research project entitled Meteorology Messages. This research is being conducted online via a Qualtrics hosted survey. You were selected as a possible participant because you are an Amazon MTurk Worker. You must be at least 18 years of age to participate in this study.

Please read this document and contact me to ask any questions that you may have BEFORE agreeing to take part in my research.

What is the purpose of this research? The purpose of this research is to understand how meteorology messages are received.

How many participants will be in this research? About 1000 people will take part in this research.

What will I be asked to do? If you agree to be in this research, you will be asked to read a message and then answer questions about what was said.

How long will this take? Your participation will take approximately ten minutes.

What are the risks and/or benefits if I participate? There are no risks and no benefits from being in this research.

Will I be compensated for participating? You will be reimbursed for your time and participation in this research. You will receive \$2.00 for successfully completing the survey.

Who will see my information? In research reports, there will be no information that will make it possible to identify you. Research records will be stored securely and only approved researchers and the OU Institutional Review Board will have access to the records. In addition, the Oklahoma Climatological Survey will have access to the research records.

What will happen to my data in the future? After removing all identifiers, we might share your data with other researchers or use it in future research without obtaining additional consent from you.

Do I have to participate? No. If you do not participate, you will not be penalized or lose benefits or services unrelated to the research. If you decide to participate, you don't have to answer any question and can stop participating at any time.

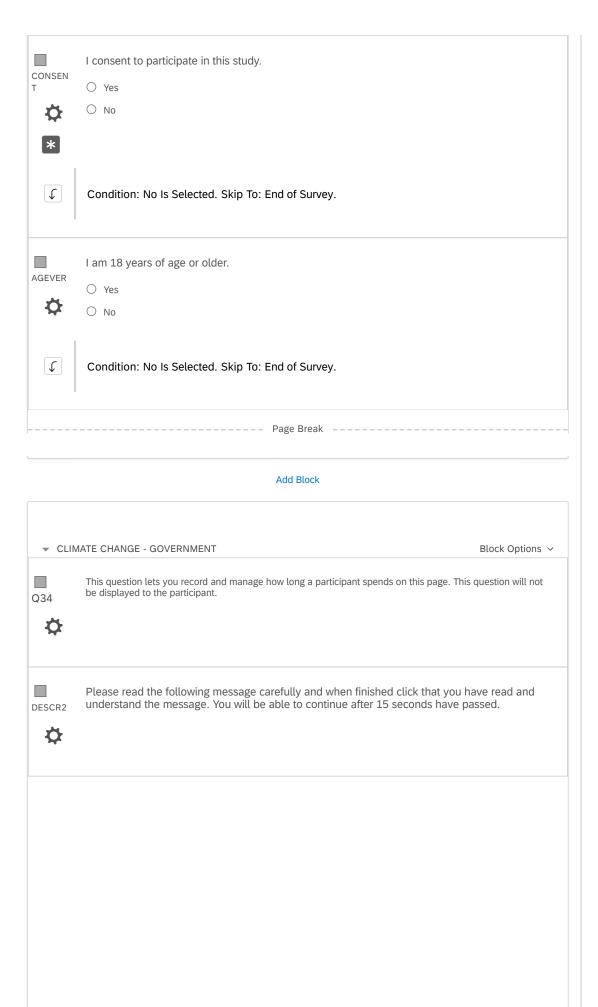
Who do I contact with questions, concerns or complaints? If you have questions, concerns or complaints about the research or have experienced a research-related injury, contact me at 405-325-3126 or w.howe@ou.edu.

You can also contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405-325-8110 or irb@ou.edu if you have questions about your rights as a research participant, concerns, or complaints about the research and wish to talk to someone other than the researcher(s) or if you cannot reach the researcher(s).

Please keep this document for your records. By providing information to the researcher(s), I am agreeing to participate in this research.

IRB#: 11315

Expiration Date: 10/22/2020



cc_gov *	800 million people are currently vulnerable to climate change impacts. According to a recent report, released by the federal government, eleven percent of the world's population is currently vulnerable to climate change impacts such as droughts, floods, heat waves, severe storms, and sea-level rise. O I have read and I understand this message. O I have not read this message. Condition: I have read, but do not und Is Selected. Skip To: End of Survey. Condition: I have not read this message. Is Selected. Skip To: End of Survey.
I	
	Add Block
▼ CLIM	MATE CHANGE - NON PROFIT Block Options >
Q35	This question lets you record and manage how long a participant spends on this page. This question will not be displayed to the participant.
□ Q7	Please read the following message carefully and when finished click that you have read and understand the message. You will be able to continue after 15 seconds have passed.
CC_NP	800 million people are currently vulnerable to climate change impacts. According to a recent report, released by a non-profit organization, eleven percent of the world's population is currently vulnerable to climate change impacts such as droughts, floods, heat waves, severe storms, and sea-level rise.
	I have read and I understand this message.
	I have read, but do not understand this message. I have not read this message.
	C This is read and message.
T	Condition: I have read, but do not und Is Selected. Skip To: End of Survey.
T	Condition: I have not read this message. Is Selected. Skip To: End of Survey.

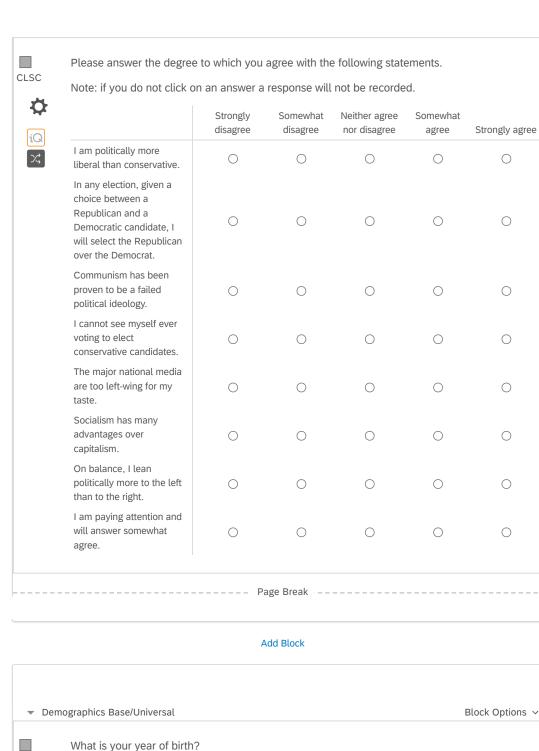
Add Block

▼ EXT	REME WEATHER - GOVERNMENT Block Options >
Q36	This question lets you record and manage how long a participant spends on this page. This question will not be displayed to the participant.
Q10	Please read the following message carefully and when finished click that you have read and understand the message. You will be able to continue after 15 seconds have passed.
EW_GOV	800 million people are currently vulnerable to extreme weather events.
*	According to a recent report, released by the federal government, eleven percent of the world's population is currently vulnerable to extreme weather events such as droughts, floods, heat waves, severe storms, and sea-level rise.
	I have read and I understand this message.
	I have read, but do not understand this message.
	O I have not read this message.
t	Condition: I have read, but do not und Is Selected. Skip To: End of Survey. Condition: I have not read this message. Is Selected. Skip To: End of Survey.
	Add Block
▼ EXT	REME WEATHER - NON-PROFIT Block Options >
Q37	This question lets you record and manage how long a participant spends on this page. This question will not be displayed to the participant.
Q13	Please read the following message carefully and when finished click that you have read and understand the message. You will be able to continue after 15 seconds have passed.

Ac pe we	800 million people are currently vulnerable to extreme weather events. According to a recent report, released by a non-profit organization, eleven percent of the world's population is currently vulnerable to extreme weather events such as droughts, floods, heat waves, severe storms, and sea-level rise.							
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\circ	I have read, but do r	not understand this me	essage.					
\circ	I have not read this r	message.						
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Со	ondition: I have not	t read this message	. Is Selected.	Skip To: End o	of Survey.			
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	Important	0	\circ	\circ	\circ	\circ
	Serious	0	\circ	\circ	\circ	\circ
	Disturbing	0	\circ	\circ	\circ	\circ
	Answer slightly well	0	0	0	0	0
		Pa	ge Break			
		A	dd Block			
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SCC	If you had a question a from?	about climate char	nge what orga	nizations woul	d you seek ii	nformation
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-	S					
Q Q	Organization 2					
.Q.	Organization 2					
.Q.	Organization 2 Organization 3					
Q	Organization 2					
Q	Organization 2 Organization 3					
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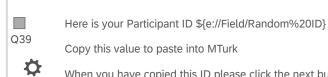
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MAN	NIPULATION CHECK						Block	Options
ис Ъ	Please answer the degre							
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	The purpose of the message was to provide information about Climate Change.	0	0	0	0	0	0	0
	The purpose of the message was to provide information about Severe Weather Events.	0	0	0	0	0	0	0
	The message was a report from the federal government.	0	\circ	0	0	0	0	\circ
	The message was a report from a non-profit organization.	0	0	0	0	0	0	0
			– Page Bi	reak				
			Add Blo	ock				
Con	servatism - Liberalism Scale;	Mehrabian,	1996				Block	Options





SCHOOL	What is the highest level of school you have completed or the highest degree you have received?
25	C Less than high school degree
34	High school graduate (high school diploma or equivalent including GED)
	○ Some college but no degree
	Associate degree in college (2-year)
	Bachelor's degree in college (4-year)
	Master's degree
	O Doctoral degree
	Professional degree (JD, MD)
ETHNIC	Are you Spanish, Hispanic, or Latinx or none of these?
ETHINIC	○ Yes
₽:	O None of these
RACE	Choose one or more races that you consider yourself to be:
مدر	☐ White ☐ Asian
-Q:	☐ Black or African American ☐ Native Hawaiian or Pacific Islander
iQ	Stack of Afficial Afficiation Native Hawaiian of Facility Islander
	American Indian or Alaska Native
	What sex were you assigned at birth, meaning on your original birth certificate?
SEX	○ Male
₽	○ Female
	○ Undetermined
	What is your ZIP code?
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₽	
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L ₂	Display This Question: If Are you Spanish, Hispanic, or Latinx or none of these? Yes Is Selected
	Are you Spanish, Hispanic, or Latinx?
ETHNICS	☐ Spanish
₽	Hispanic
	Latinx
	Information about income is very important to understand. Would you please give your best
INCOME	guess?
₩	Please indicate the answer that includes your entire household income in (previous year) before taxes.
	O Less than \$10,000
	○ \$10,000 to \$19,999
	○ \$20,000 to \$29,999
	○ \$30,000 to \$39,999
	○ \$40,000 to \$49,999
	○ \$50,000 to \$59,999
	○ \$60,000 to \$69,999
	○ \$70,000 to \$79,999
	○ \$80,000 to \$89,999
	○ \$90,000 to \$99,999
	○ \$100,000 to \$149,999
	○ \$150,000 or more
	How would you describe the area where you live?
LIVAREA	O Rural
₽	○ Suburban
	○ Urban
	What region of Texas most accurately represents where you live?
Q28	O North Texas
₽	○ East Texas
	○ West Texas
	O South Texas
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iQ

When you have copied this ID please click the next button to complete your survey.

Then return to MTurk and enter your participant ID in the code box.

Add Block



