Assessing Public Support for an International Climate Treaty Including Willingness-to-Pay in the United States & China 2015/2017

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University of Wisconsin Eau Claire — The Power of AND

Introduction

Climate change is the most important environmental/societal issue facing our world today. Because of the global causes/consequences of climate change, international cooperation is essential in developing, implementing and financing successful mitigation policy action.

Public support around the world will likely be a significant determining factor regarding if/when climate change mitigation policies are enacted. Moreover, China and the United States are central to international policy negotiations because they are the world's two largest economies and also the largest greenhouse gas (GHG) polluters.

Using data described in our previous poster, we assess support for an international climate change treaty among citizens in China and the U.S. Additionally, there will be significant costs associated with undertaking global climate change mitigation policies. Thus, we also explore the degree to which citizens in these two important countries are willing to pay these increased costs in the context of a higher cost of living.

Two randomized questions were used to explore Chinese and American support for an international climate treaty. One question was unconditional, while the other was conditional on knowing the other country would not participate.

To investigate Chinese and American willingness-to-pay for climate policy action to reduce GHG emissions we employ a double-bounded dichotomous choice contingent valuation framework with purchasing power parity (PPP).

International Climate Treaty Question

2015 International Treaty Question:

Government leaders from around the world will meet in Paris, France in November, 2015 to negotiate a new international treaty to limit greenhouse gas emissions.

全球政界首脑将于2015年11月在法国巴黎会见商榷有关限制温室气体排放的国际新协议。

How much do you support/oppose United States signing such a treaty to commit to reducing its greenhouse gas emissions?

请问您对中国签署承诺减少温室气体排放协议的支持程度？
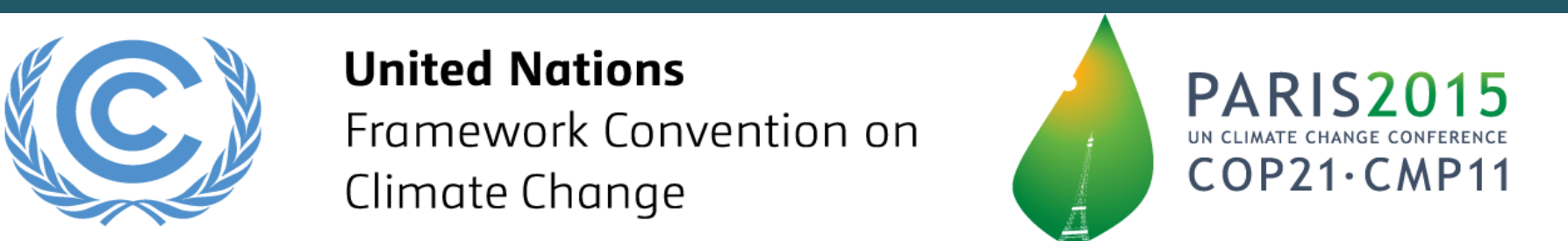
2017 International Treaty Question:

In 2016, government leaders from around the world, including China and the United States, ratified a new international treaty to limit greenhouse gas emissions in order to avoid the most dangerous impacts of climate change/global warming.

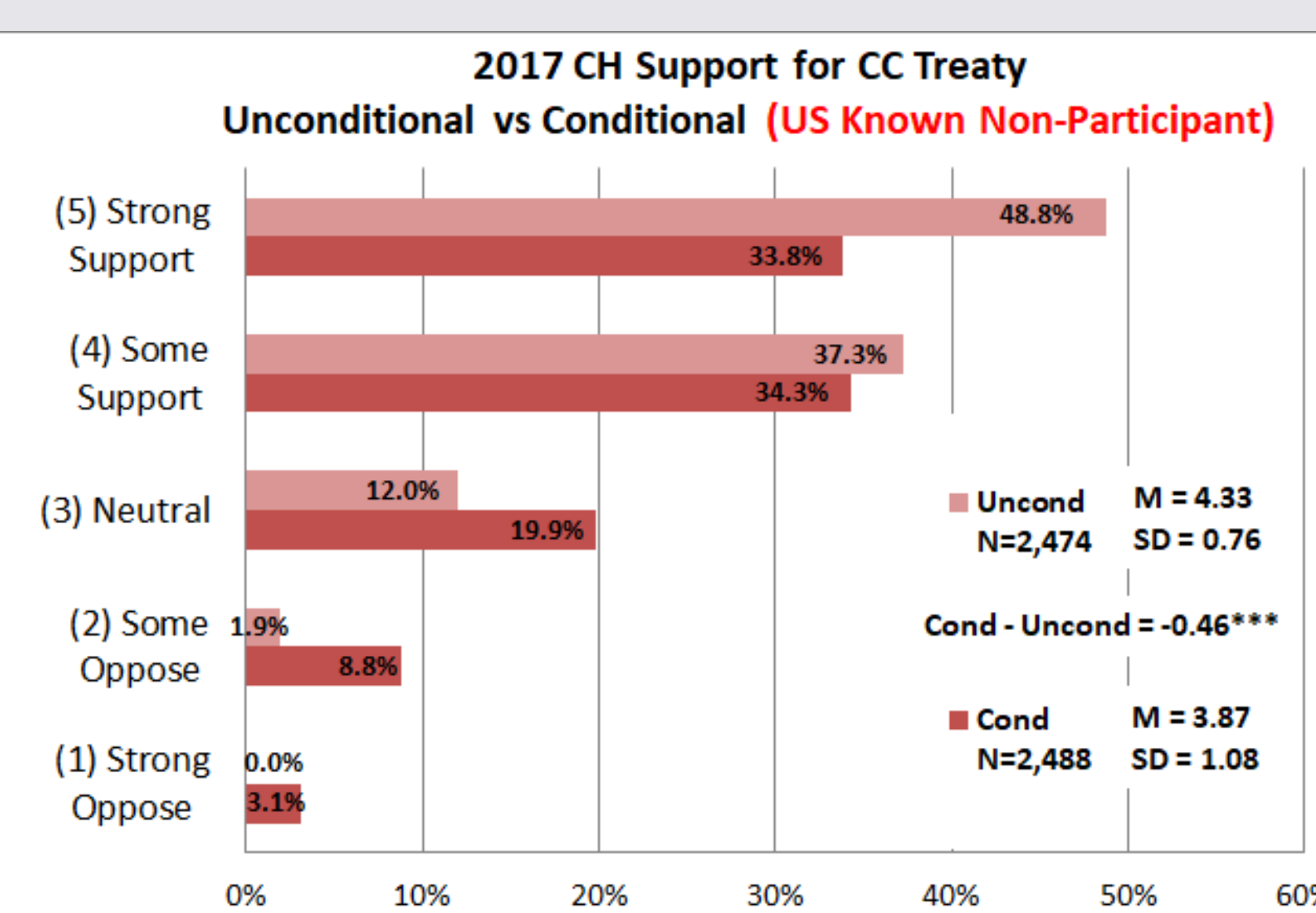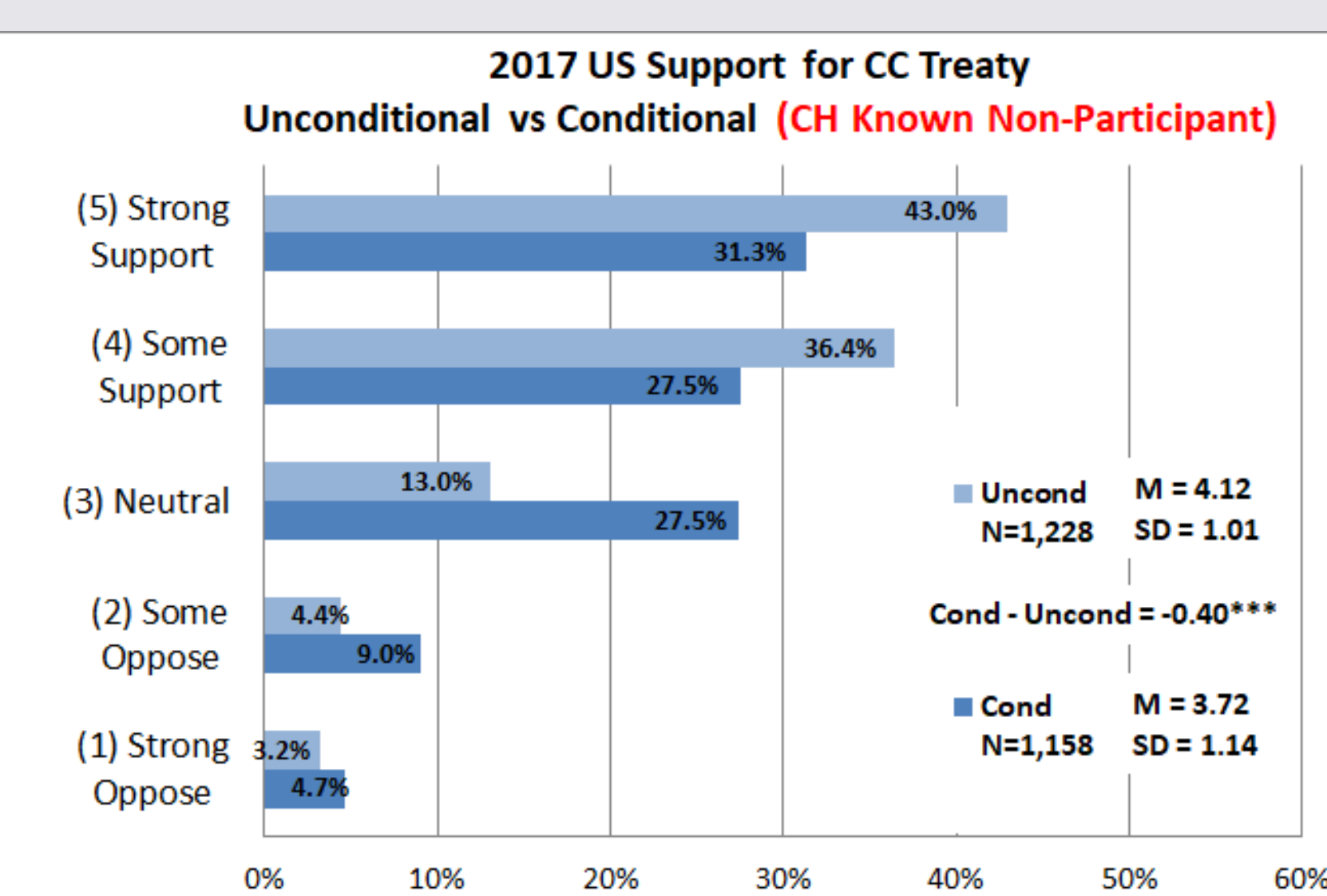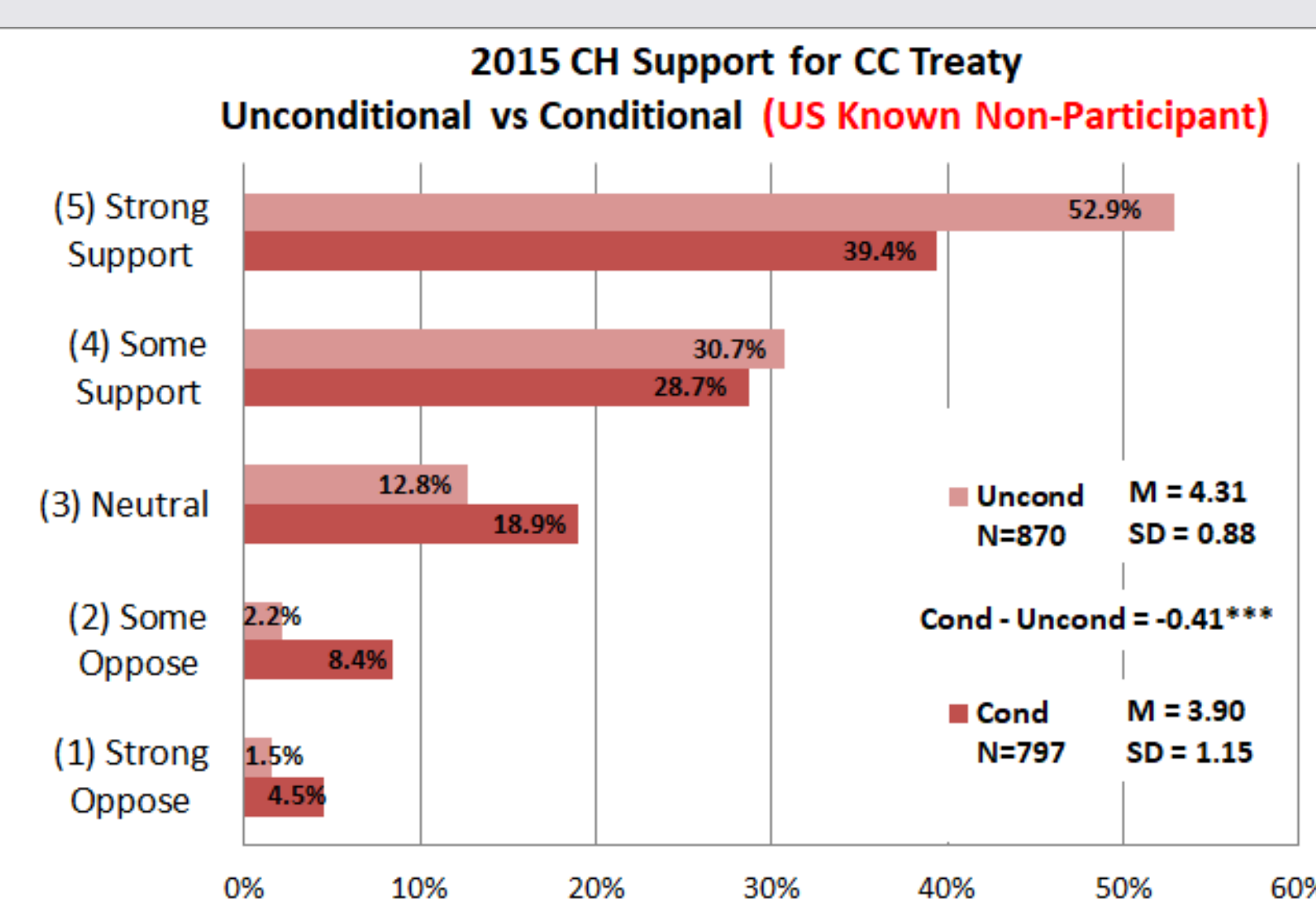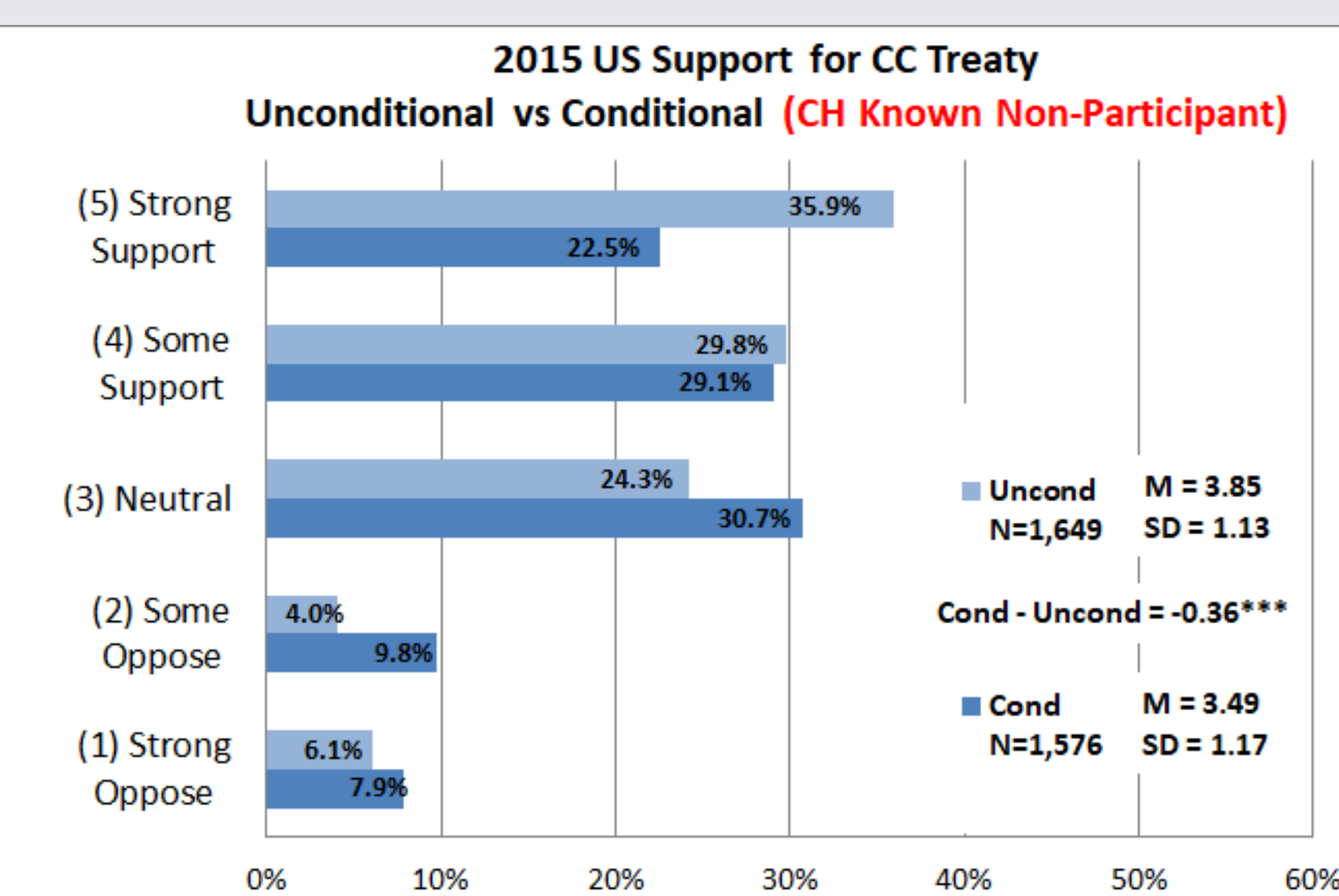在2016年，许多来自全世界的政府领导，其中包括中国和美国，批准了一个新的国际条约来限制温室气体排放以避免温室气体对全球变暖造成更危险的影响。

How much do you support/oppose United States fulfilling their commitment to limit greenhouse gas emissions through this international treaty?

请问您是否支持或反对中国兑现在国际条约上关于限制温室气体排放的承诺？

Results from these questions are presented graphically in the figures below including statistical tests of differences in means between conditional and unconditional support in each country in each year.

United Nations Framework Convention on Climate Change — PARIS2015 COP21·CMP11

Graphical & Statistical Analysis

2015 US Support for CC Treaty
Unconditional vs Conditional (CH Known Non-Participant)

Category	Uncond	Cond
(5) Strong Support	35.9%	22.5%
(4) Some Support	29.8%	29.1%
(3) Neutral	24.3%	30.7%
(2) Some Oppose	4.0%	9.8%
(1) Strong Oppose	6.1%	7.9%

Uncond M = 3.85 N=1,649 SD = 1.13
Cond M = 3.49 N=1,576 SD = 1.17
Cond - Uncond = -0.36***

2015 CH Support for CC Treaty
Unconditional vs Conditional (US Known Non-Participant)

Category	Uncond	Cond
(5) Strong Support	52.9%	39.4%
(4) Some Support	30.7%	28.7%
(3) Neutral	12.8%	18.9%
(2) Some Oppose	2.2%	8.4%
(1) Strong Oppose	1.5%	4.5%

Uncond M = 4.31 N=870 SD = 0.88
Cond M = 3.90 N=797 SD = 1.15
Cond - Uncond = -0.41***

2017 US Support for CC Treaty
Unconditional vs Conditional (CH Known Non-Participant)

Category	Uncond	Cond
(5) Strong Support	43.0%	31.3%
(4) Some Support	36.4%	27.5%
(3) Neutral	13.0%	27.5%
(2) Some Oppose	4.4%	9.0%
(1) Strong Oppose	3.2%	4.7%

Uncond M = 4.12 N=1,228 SD = 1.01
Cond M = 3.72 N=1,158 SD = 1.14
Cond - Uncond = -0.40***

2017 CH Support for CC Treaty
Unconditional vs Conditional (US Known Non-Participant)

Category	Uncond	Cond
(5) Strong Support	48.8%	33.8%
(4) Some Support	37.3%	34.3%
(3) Neutral	12.0%	19.9%
(2) Some Oppose	1.9%	8.8%
(1) Strong Oppose	0.0%	3.1%

Uncond M = 4.33 N=2,474 SD = 0.76
Cond M = 3.87 N=2,488 SD = 1.08
Cond - Uncond = -0.46***

Unconditional vs. Conditional Support

Difference in Means - 2015 vs 2017

	2017 Mean (SD)	2015 Mean (SD)	2017 - 2015 Diff
US: Uncond	4.12 (1.01)	3.85 (1.13)	0.270***
US: Cond	3.72 (1.14)	3.49 (1.17)	0.230***
CH: Uncond	4.33 (0.759)	4.31 (0.884)	0.020
CH: Cond	3.87 (1.08)	3.90 (1.15)	-0.030

- Increase in support for US, conditional and unconditional
- No change in support for CH, conditional or unconditional

Probit Regression Model

Discrete Binomial Dependent Variable

- Strongly oppose
- Somewhat oppose
- Neither support/oppose

  otherwise = 0

- Somewhat support
- Strongly support

  support = 1

Note: Standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.10$

Probit Regression Results

Variable	US 2015	US 2017	CH 2015	CH 2017
TrtyCond	-0.182*** (0.020)	-0.284*** (0.020)	-0.165*** (0.021)	-0.185*** (0.011)
CCScore	0.082*** (0.004)	0.058*** (0.004)	0.031*** (0.004)	0.045*** (0.002)
SciTrust	-----	0.133*** (0.024)	-----	0.107*** (0.014)
NegEcon	-----	-0.063*** (0.027)	-----	-0.043*** (0.014)
Adult	-0.091** (0.043)	-0.070** (0.034)	-0.007 (0.033)	-0.045*** (0.017)
Age	-0.001 (0.001)	0.0007 (0.001)	-0.0002 (0.001)	0.002*** (0.001)
Male	0.047** (0.020)	-0.037* (0.021)	-0.012 (0.021)	-0.003 (0.012)
Degree	0.020 (0.023)	-0.016 (0.023)	-0.004 (0.027)	0.010 (0.013)
IncPPP	0.0002 (0.0002)	0.0008*** (0.0003)	0.0008 (0.0008)	0.0007 (0.0004)
Minority	-0.069*** (0.025)	-0.019 (0.022)	0.049 (0.044)	0.013 (0.027)
Media	0.016 (0.013)	-----	0.031* (0.018)	-----
Lib	0.157*** (0.026)	0.068** (0.029)	-----	-----
Mod	0.033 (0.024)	-0.010 (0.025)	-----	-----
PseudoR²	0.293	0.408	0.073	0.184
N	3,197	2,386	1,614	4,939

Mean Willingness-to-Pay

Variable	US 2015	US 2017	CH 2015	CH 2017
Constant	57.61***	128.21***	72.68***	146.89***
N	4,905	2,386	2,533	4,948

Note: PPP International $ *** $p<0.01$

- 2015 Annual: US = $691.3   CH = $872.2   CH > US (1.26X)
- 2017 Annual: US = $1,538.5   CH = $1,762.7   CH > US (1.15X)
- US 2017 > 2015 (2.25X)   CH 2017 > 2015 (2.02X)

Willingness-to-Pay Question

2015 Willingness-to-Pay Question:

Most policies to address climate change are designed to reduce greenhouse gas emissions which will likely increase your household expenditures on heating, electricity, transportation, food and other goods and services.

多数应对气候变化的政策包括对二氧化碳排放加价这将会增加您在取暖，用电，交通出行，食物与其他商品以及服务费用方面的家庭开支。

Would you support a policy to address climate change that increased your average monthly household expenditures by **$X**?

如果实施应对气候变化的政策将会使您每月平均家庭开支增加X元，您是否会支持该政策？

2017 Willingness-to-Pay Question:

In order to make progress toward **avoiding the most dangerous impacts** of climate change/global warming, scientists have estimated that global greenhouse gas emissions need to be reduced by approximately **20%** by the year **2030**.

Most policies designed to meet this target are expected to increase household expenditures on heating, electricity, transportation, food and other goods and services.

为了尽量避免全球变暖造成更危险的影响，科学家估计到2030年之前全球的温室气体需要减少大约20%。

为了达到此目的，大多数的政策要求住户增加关于取暖，用电，交通出行，食物和其他服务方面的家庭开支。

Would you support a policy to reduce greenhouse gas emissions by approximately 20% by the year 2030 if it increased your average monthly household expenditures by **$X**?

为了在2030年前减少约20%的温室气体排放，您需要增加每月平均家庭开支X元，您是否会支持该政策？

Analysis of Initial Bid Acceptance

Full Sample WTP Initial Bid Acceptance 2015

Initial bid ($ or ¥)		US	China
$10 (35¥)	N	989	522
	% Accept	65.4%	79.7%
$20 (70¥)	N	985	512
	% Accept	62.9%	75.4%
$40 (140¥)	N	970	504
	% Accept	54.2%	60.9%
$60 (210¥)	N	1004	506
	% Accept	46.2%	59.1%
$80 (280¥)	N	957	519
	% Accept	44.6%	56.3%
Total	N	4,905	2,563
	% Accept	54.7%	66.3%

Full Sample WTP Initial Bid Acceptance 2017

Initial bid ($ or ¥)		US	China
$20 (70¥)	N	339	692
	% Accept	87.0%	87.6%
$40 (140¥)	N	345	711
	% Accept	77.1%	80.6%
$60 (210¥)	N	364	692
	% Accept	65.7%	73.7%
$80 (280¥)	N	334	711
	% Accept	59.0%	71.0%
$100 (350¥)	N	330	720
	% Accept	54.2%	68.8%
$120 (420¥)	N	347	720
	% Accept	51.3%	66.0%
$140 (490¥)	N	327	702
	% Accept	41.6%	58.1%
Total	N	2,386	4,948
	% Accept	62.4%	72.2%

- Declining acceptance of higher initial bid values
- Higher average acceptance rate in CH for both years
- Higher average acceptance in 2017 for both countries

Note: PPP International $
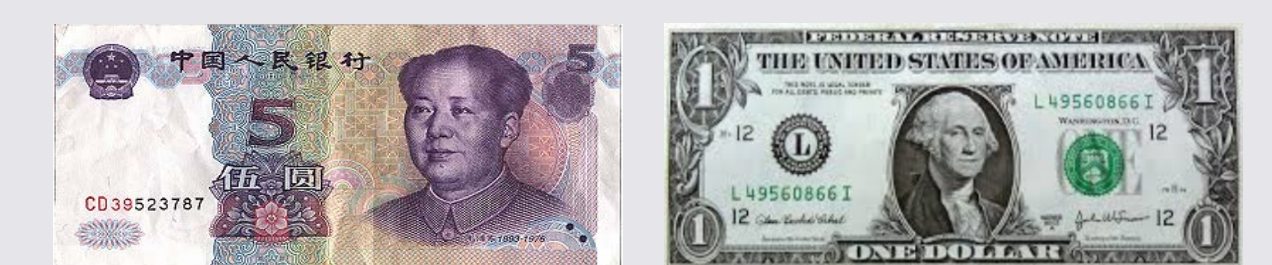
Conclusion & Discussion

- Significant withdraw of Chinese and American support conditional on non-reciprocity
- Chinese support significantly higher compared to the U.S. in both years
- Significant increase in support among U.S. respondents in 2017 compared to 2015

- Chinese show significantly higher mean WTP compared to Americans (PPP)
- Higher mean WTP in both countries in 2017 compared to 2015

Please see our final poster titled, *A Continued Assessment of Chinese and American Climate Change Views 2015/2017 Including Open-Ended Survey Responses* for results for an extended/continued analysis using the same survey data.