

IS BEST ANSWER REALLY THE BEST ANSWER? THE POLITENESS BIAS

Shun-Yang Lee

Department of Operations and Information Management, School of Business, University of Connecticut,
Storrs, CT 06269-1041 U.S.A. {shun-yang.lee@uconn.edu}

Huaxia Rui

Simon Business School, University of Rochester,
Rochester, NY 14627 U.S.A. {huaxia.rui@simon.rochester.edu}

Andrew B. Whinston

McCombs School of Business, The University of Texas at Austin,
Austin, TX 78705 U.S.A. {abw@uts.cc.utexas.edu}

Appendix A

Details of Random Coefficient Logit Model Estimation Procedure

In this section, we briefly describe our estimation procedures of the random coefficient logit model used to study the question asker acceptance. As described in the main text, we specify a random coefficient logit model to study the relationship between politeness and best answer choices. Recall that Equation (2) is the probability of a given answer being chosen. Let y_{qa} be the indicator which takes the value 1 if answer a , which addresses question q , is chosen as the best answer, and 0 otherwise. Then the likelihood function for question q can be written as

$$S_q = \int \prod_{a=1}^{A(q)} \left[\frac{\exp(X'_{qa} \cdot \beta)}{\sum_{a=1}^{A(q)} \exp(X'_{qa} \cdot \beta)} \right]^{y_{qa}} f(\beta | \theta) d\beta \quad (3)$$

Since the integral in Equation (3) does not have a closed form solution, we approximate it through simulation (Train 2009). Specifically, for question q and a given θ , draw β from $f(\beta|\theta)$ a total of R times and mark them as $\beta^1, \beta^2, \dots, \beta^R$. Then we can use these draws to approximate the likelihood of a given question, and the integral in Equation (3) becomes

$$\widehat{S}_q = \frac{1}{R} \sum_{r=1}^R \prod_{a=1}^{A(q)} \left[\frac{\exp(X'_{qa} \cdot \beta^r)}{\sum_{a=1}^{A(q)} \exp(X'_{qa} \cdot \beta^r)} \right]^{y_{qa}} \quad (4)$$

Our goal is to estimate the parameters, θ , of the density function $f(\beta|\theta)$. Recall that β is normally distributed. Assume $\beta \sim N(\mu, \sigma^2)$. The mean, μ , and variance, σ^2 , of β can be estimated through maximizing the joint simulated log-likelihood function of all questions:

$$SLL = \sum_{q=1}^Q \ln[\widehat{S}_q] = \sum_{q=1}^Q \ln \left\{ \frac{1}{R} \sum_{r=1}^R \prod_{a=1}^{A(q)} \left[\frac{\exp(X'_{qa} \cdot \beta^r)}{\sum_{a=1}^{A(q)} \exp(X'_{qa} \cdot \beta^r)} \right]^{y_{qa}} \right\} \tag{5}$$

The maximum simulated likelihood estimator (MSLE) maximizes Equation (5). Note that during the model estimation, questions that received only one answer and questions that did not have a corresponding best answer chosen will be dropped. This is because answers corresponding to these questions do not have within cluster variations in their outcome variable and are thus uninformative to the model estimation.

Reference

Train, K. E. 2009. *Discrete Choice Methods with Simulation*, Cambridge, UK: Cambridge University Press.

Appendix B

Random Coefficient Logit Model with More Draws

DV	isBestAnswer			
Variable	Mean		Standard Deviation	
	(1) Mean of Coefficient	(2) Standard Error of Coefficient	(3) Mean of Coefficient	(4) Standard Error of Coefficient
Impoliteness	-8.2911**	3.4786	9.3606*	4.9508
YOUWEI	-3.7070***	1.0047	10.1900**	4.0190
WE	0.1078	0.0860	0.1094	0.4927
SHEHE	-4.9784	8.2496	9.4345	35.1345
THEY	-5.3427**	2.2817	1.7699	9.7093
IPRON	1.1365	0.8428	8.1366*	4.5765
ARTICLE	2.3581***	0.8047	0.4261	4.4856
SIXLTR	1.6264***	0.4138	1.5026	2.8486
Answer Vote	1.1985***	0.0691	0.8012***	0.0619
log(Reputation)	-0.0392**	0.0175	0.1494**	0.0648
Impoliteness*log(Reputation)	1.0113**	0.4829	1.0321	0.9140
Word Count	0.0049***	0.0004	0.0040***	0.0009
HasCode	0.4547***	0.0813	0.6201	0.3831
log(TimeDiff)	0.0883***	0.0116	0.0483	0.0621
Number of Questions	10,025			
Number of Answers	24,503			

Notes: Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Table B2. Question Asker Acceptance Model (Random Coefficient Logit – 350 Draws)

DV	isBestAnswer			
	Mean		Standard Deviation	
	(1) Mean of Coefficient	(2) Standard Error of Coefficient	(3) Mean of Coefficient	(4) Standard Error of Coefficient
Impoliteness	-8.0251**	3.4618	8.2351	5.3972
YOUWEI	-3.7549***	1.0098	10.7706***	3.7093
WE	0.1118	0.0866	0.0929	0.4664
SHEHE	-5.1860	8.2135	3.3509	36.2030
THEY	-5.4118**	2.3043	1.3257	10.3975
IPRON	1.1121	0.8488	8.3569*	4.5246
ARTICLE	2.3922***	0.8125	1.0152	4.0995
SIXLTR	1.6170***	0.4122	0.6968	3.5048
Answer Vote	1.2091***	0.0699	0.8097***	0.0582
log(Reputation)	-0.0381**	0.0177	0.1631***	0.0605
Impoliteness*log(Reputation)	0.9795**	0.4822	1.3155*	0.7618
Word Count	0.0051***	0.0004	0.0042***	0.0009
HasCode	0.4557***	0.0850	0.6055	0.4927
log(TimeDiff)	0.0887***	0.0117	0.0313	0.0855
Number of Questions	10,025			
Number of Answers	24,503			

Notes: Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Appendix C

All (High- and Low-Proficiency) Users

Table C1. Question Asker Acceptance Model All Users (Random Coefficient Logit – 50 Draws)

DV Variable	isBestAnswer			
	Mean		Standard Deviation	
	(1) Mean of Coefficient	(2) Standard Error of Coefficient	(3) Mean of Coefficient	(4) Standard Error of Coefficient
Impoliteness	-6.5500***	1.2205	9.5981***	1.7626
YOUWEI	-1.7669***	0.4052	3.3864	2.6110
WE	0.1023***	0.0396	0.1054	0.4607
SHEHE	0.5107	3.9191	23.9443**	11.3986
THEY	0.6970	1.1313	2.4919	4.9838
IPRON	1.6376***	0.3330	1.2630	2.5068
ARTICLE	1.9528***	0.3251	1.6672	2.0016
SIXLTR	1.6750***	0.1686	0.2153	0.9007
Answer Vote	0.9318***	0.0205	0.6357***	0.0192
log(Reputation)	-0.0135**	0.0067	0.0330	0.0340
Impoliteness*log(Reputation)	0.7046***	0.1693	0.2808	0.3905
Word Count	0.0037***	0.0001	0.0026***	0.0003
HasCode	0.3393***	0.0303	0.1951	0.1396
log(TimeDiff)	0.0462***	0.0044	0.0176	0.0143
Number of Questions	30,858			
Number of Answers	94,610			

Notes: Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1

Table C2. General Audience Reception Model All Users (Fixed-Effect Negative Binomial Model)

DV Variable	# Votes Received Coefficient (S.E.)
IsBestAnswer	0.6666*** (0.0060)
Impoliteness	-0.2370 (0.3186)
YOUWEI	-0.6760*** (0.0925)
WE	0.0643*** (0.0105)
SHEHE	-1.8781*** (0.5967)
THEY	0.0888 (0.3011)
IPRON	-0.2075** (0.0980)
ARTICLE	0.3785*** (0.0938)
SIXLTR	0.6532*** (0.0476)
log(Reputation)	0.0773*** (0.0018)
Impoliteness*log(Reputation)	0.0823* (0.0422)
Word Count	0.0007*** (0.0000)
HasCode	0.2384*** (0.0092)
log(TimeDiff)	-0.1734*** (0.0013)
Number of Questions	59,748
Number of Answers	154,937

***p < 0.01, **p < 0.05, *p < 0.1

APPENDIX D

Evaluation of the Reputation Score Reconstruction Procedure

Recall that the data dump provided by Stack Exchange does not include the time series data of users' reputation score history, and therefore we had to reconstruct such data. To verify that the reconstructed reputation scores are indeed reliable, we compare the reconstructed scores with those retrieved from Stack Exchange's API.¹ Specifically, we randomly select 500 answers and use the Stack Exchange API to retrieve the answer providers' approximate reputation score at the time of posting their answers. We then compare our own reconstructed reputation score with the API-returned reputation score. In the graph below (Figure D1) we plot each answer provider's reconstructed reputation score on the x-axis and the API-returned reputation score on the y-axis. We also plot the 45-degree line (i.e., $y = x$) for ease of interpretation. If the reconstructed reputation scores are similar to the API-returned reputation scores, then the points should lie on or close to the 45-degree line. As shown in Figure D1, almost all points lie along or close to the 45-degree line, with very few exceptions (those exceptions are mostly users whose reconstructed reputation score is 0 while the API-returned reputation score is nonzero, or vice versa). This shows that our reconstructed reputation scores are reasonably close to the approximation provided by the official Stack Exchange platform, suggesting our reconstruction mechanism is satisfactory.

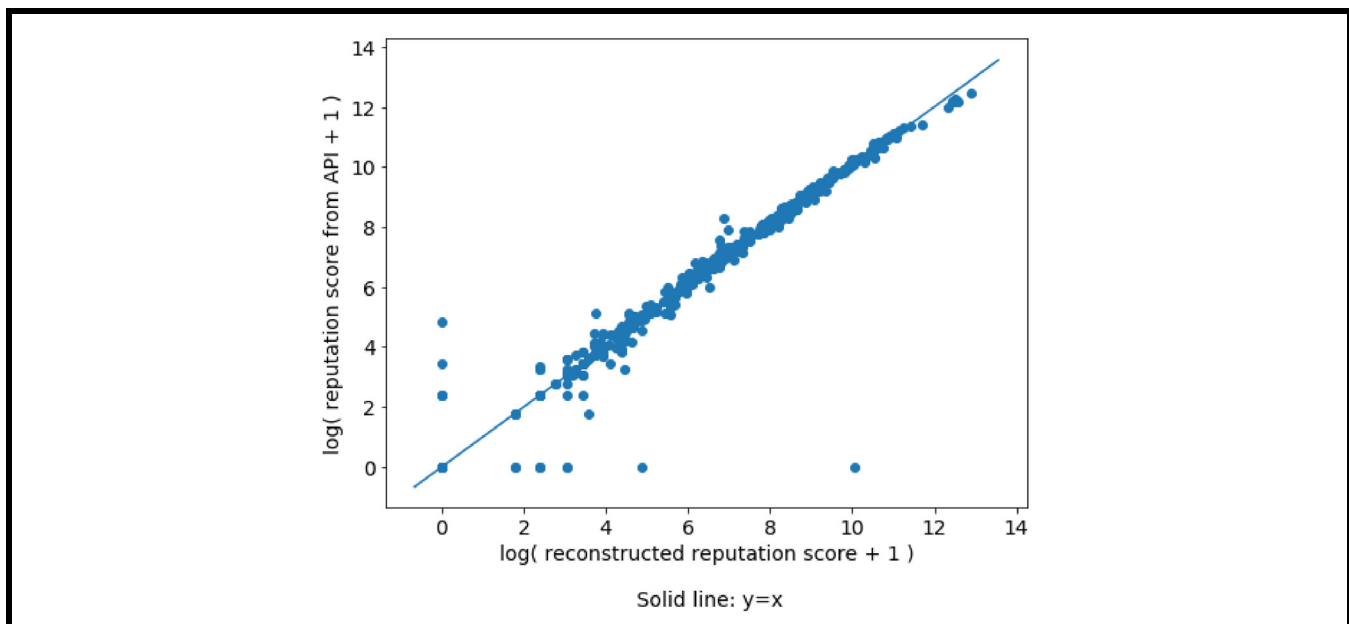


Figure D1. Comparing the Reconstructed Reputation Score with API-Returned Reputation Score

¹See <https://api.stackexchange.com/docs/reputation-on-users>

Appendix E

Questions and Answers Used in Randomized Experiment

Table E1. Questions and Answers Used in the AMT Experiment		
Question	Polite Answer	Impolite Answer
1. How do I complete a HIT?	Although I am certainly not an expert in the MTurk platform, I think the following approach should work for you in terms of completing a HIT: on the MTurk homepage there is a link "View a HIT in this group" which will give you an opportunity to preview the task before accepting it. If the HIT interests you then you would select the gold "Accept HIT" button. The Requester's instructions would then be displayed to help you complete the HIT. Finally, select the "Submit HIT" button to submit the HIT. After submission, another similar HIT will be displayed and you will be able to decide to accept or not. I hope this helps!	This is straightforward and basically foolproof: unless you have serious problem with English comprehension you should be able to do this: You need to first go to the Mechanical Turk homepage and find "View a HIT in this group" where you will be able to see what a specific HIT is about. This is a good idea because you better preview the HIT before you make the decision whether to accept it or not. If you do want to complete the HIT then you will select the "Accept HIT" button. Then just follow the Requester's instructions and "Submit HIT". Once you are done submitting the HIT you will see another similar HIT for you to accept.
2. Why is the number of HITs I can do each day limited?	I believe the reason why there is a daily limit is the possibility that certain ill-intentioned workers might utilize robots or scripts to complete HITs in an automated fashion, which is a violation of the Participation Agreement—this is not something the platform would like to see.	This obviously has to be the case—there's got to be some sort of limit. Otherwise, some ill-intentioned workers can always use a robot or some script to automate the process of completing HITs, which is a clear violation of the Participation Agreement—Mturk platform will hate to see this.
3. How much time do I have to work on a HIT?	Each task has an associated "Allotted Time," which is specified by the requester—this is the amount of time a worker is given to complete the HIT. A timer, which begins as soon as the worker accepts the HIT, will be displayed on the worker web site as a reminder. Hope this helps!	It all depends on the requester's task specification. You just need to look for the HIT's "Allotted Time," which means how long a worker can hold on to a HIT. The timer starts as soon as the worker accepts the HIT. If you are paying any attention you should be seeing a timer on the worker web site when you work on a HIT.
4. Should I keep my computer secure while using Amazon Mechanical Turk?	I would suggest that you exercise caution when instructed to click on any links or download any software package in a HIT. This is because there is a possibility that some requesters might have malicious intent, unfortunately. It's therefore highly recommended to have a working, up-to-date anti-virus software package running when working on HITs.	This is a no-brainer. Would you access any website or download any file online? There is always a risk associated with clicking on links, even if the links have been supplied by requesters. You should simply always exercise caution and keep in mind all possible security risks involved. Have an up-to-date anti-virus software package running at all time.
5. How do HITs get approved?	The approval of HITs is determined by the requester (the AMT platform doesn't interfere with the approval process). My advice would be to spend some time reading the requester's instruction carefully. It would be ideal to only accept HITs you are comfortable with as this will ensure your HIT will more likely get approved, and as a result your reputation will increase over time.	HIT approval is determined completely by the requester and has nothing to do with the Amazon Mechanical Turk platform itself. As a worker trying to get paid you need to make sure you read the requester's instruction thoroughly. If you don't think you can finish a HIT, return it instead of submitting some random response. It will hurt you eventually because a bad HIT will not get approved and your reputation will only go down. Stick to things you know and don't mess with HITs you can't do.

Table E1. Question and Answers Used in the AMT Experiment (Continued)

Question	Polite Answer	Impolite Answer
6. How do I transfer my earnings to my bank account?	Based on the explanation in the worker platform instruction, one will need to specify the amount s/he would like to transfer. This amount should not be greater than what is available for transfer. If this is the first time transferring, then bank information, such as routing and account numbers, is also required.	You need to check the worker platform instruction more carefully before posting the question, as the answer can be found there very easily. Just go to the Earnings page and enter the amount you wish to transfer (make sure this amount is not greater than what is available for transfer). Just remember that if it's your first time transferring money to a bank account you will also need to enter your bank account information (routing and account numbers)—otherwise AMT won't know where to transfer the money to.
7. Do I have to pay taxes on earnings from Amazon Mechanical Turk?	You may have to treat your MTurk earning as your taxable income. The best advice I have is to check the IRS website or consult your tax advisor to help determine if you should pay taxes on your earnings or report them on an income tax return.	Most definitely, unless you want to take the risk of tax evasion. There is nothing fundamentally different between MTurk earnings and your regular earnings, so it's most likely also taxable income. Talk to your tax advisor to determine whether you need to pay taxes on your earnings or report them on an income tax return.
8. Do I have to complete the Profile Tasks?	The Profile Tasks are optional. However, to be eligible for certain HITs, one will have to complete the Profile Tasks and obtain certain qualifications.	This question is purely subjective. We live in a free country; you don't have to complete the Profile Tasks if you don't want to. You will just be missing out from some HITs that require certain qualification—you won't get those qualifications unless you complete the Profile Tasks. But again, as I said earlier, it's up to you.
9. How do I get paid?	This might be wrong but I believe a worker will be paid when the HIT submitted is approved by the requester—this is also when the worker will see the earning transferred to his/her balance. One should perhaps keep in mind that it might take some time for the requester to review and approve the HIT. I would also note that for new workers MTurk specifies a holding period before the payment is transferred to the worker's balance as a security requirement.	You as a worker will only be paid when the requester approves the HIT you submitted. Also, you need to give the requester time—only when the requester has approved the HIT will MTurk transfer the money to your earnings balance because s/he need to make sure your work doesn't suck. If you are a new worker then you need to wait—there is a holding period before your money is transferred to your earnings balance to ensure you are not a fraud.
10. What is a Mechanical Turk Master?	Mechanical Turk master is a distinction given to workers who demonstrate accuracy on specific types of HITs. It is a distinction MTurk determines and assigns to workers, and it is unfortunately not possible to apply for one. I would also add that masters are expected to continuously demonstrate excellence in HITs to retain the master status. As a master one will be eligible to HITs that require a master qualification; a master will also have access to a private forum available only to masters.	Mechanical Turk master is an elite status. You need to demonstrate accuracy on specific types of HITs to be awarded one. You don't just get it—MTurk determines and assigns the master distinction. The master status is also not permanent: if you no longer perform satisfactorily then MTurk can take away the distinction. Listen up—your best bet is to complete HITs well consistently. You need the master status to access certain HITs (those requiring a master qualification) and to participate in a Master-only private forum.