

Culture and Social Influence

Evidence From Online Reviews

Cayruã Chaves Fonseca (Cay)

August 31, 2023

cayrua.chaves@cemfi.edu.es

Motivation

1. **Individual** choices are influenced by the **behavior of others** (information, norms, image)
 - Empirical evidence from lab (Asch, 1956; Zafar, 2011; Goeree & Yariv, 2015) and field experiments (Frey & Meier, 2004; Mas & Moretti, 2009; Y. Chen et al., 2010)

Motivation

1. **Individual** choices are influenced by the **behavior of others** (information, norms, image)
 - Empirical evidence from lab (Asch, 1956; Zafar, 2011; Goeree & Yariv, 2015) and field experiments (Frey & Meier, 2004; Mas & Moretti, 2009; Y. Chen et al., 2010)
2. **Cross-cultural variation** in psychological factors relevant for decision making
 - Economics literature: time and risk preferences, reciprocity, altruism, trust (Falk et al., 2018)
 - Other social sciences: analytic vs holistic reasoning, moral reasoning, positive self-views, **motivations to conform** (Bond & Smith, 1996; Henrich et al., 2010; Schulz et al., 2019)

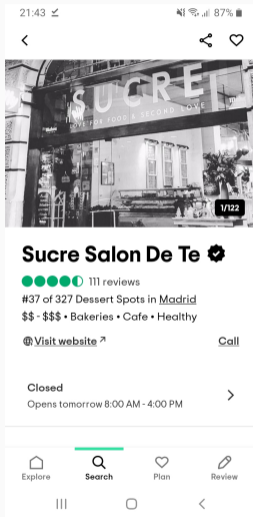
Motivation

1. **Individual** choices are influenced by the **behavior of others** (information, norms, image)
 - Empirical evidence from lab (Asch, 1956; Zafar, 2011; Goeree & Yariv, 2015) and field experiments (Frey & Meier, 2004; Mas & Moretti, 2009; Y. Chen et al., 2010)
2. **Cross-cultural variation** in psychological factors relevant for decision making
 - Economics literature: time and risk preferences, reciprocity, altruism, trust (Falk et al., 2018)
 - Other social sciences: analytic vs holistic reasoning, moral reasoning, positive self-views, **motivations to conform** (Bond & Smith, 1996; Henrich et al., 2010; Schulz et al., 2019)
3. **Social influence** affects reviewers submitting their opinions on **online review platforms** (Muchnik et al., 2013) and affects accuracy of aggregate information (Dai et al., 2018)

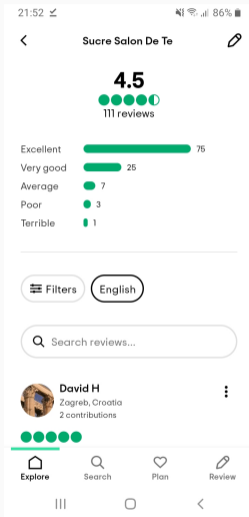
Motivation

1. **Individual** choices are influenced by the **behavior of others** (information, norms, image)
 - Empirical evidence from lab (Asch, 1956; Zafar, 2011; Goeree & Yariv, 2015) and field experiments (Frey & Meier, 2004; Mas & Moretti, 2009; Y. Chen et al., 2010)
2. **Cross-cultural variation** in psychological factors relevant for decision making
 - Economics literature: time and risk preferences, reciprocity, altruism, trust (Falk et al., 2018)
 - Other social sciences: analytic vs holistic reasoning, moral reasoning, positive self-views, **motivations to conform** (Bond & Smith, 1996; Henrich et al., 2010; Schulz et al., 2019)
3. **Social influence** affects reviewers submitting their opinions on **online review platforms** (Muchnik et al., 2013) and affects accuracy of aggregate information (Dai et al., 2018)
 - This paper studies **cultural variation** in **social influence** on **online review** platforms
 - Online reputation system are widespread: eBay, Amazon, Rotten Tomatoes, Tripadvisor...
 - **Social influence** can **impact** the **information** content of reviews

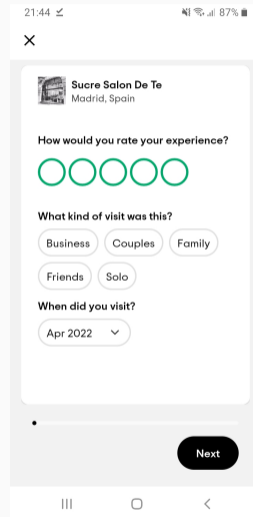
Setting: Restaurant Reviews on Tripadvisor



(a) Basic Info.

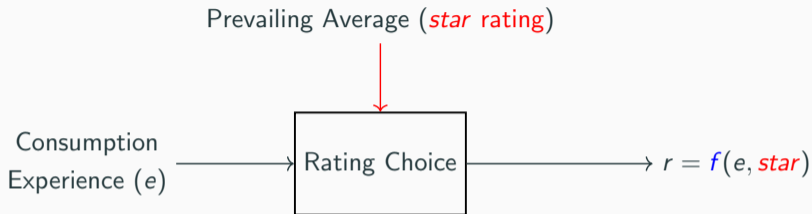


(b) Previous Reviews



(c) Submitting a Review

Conceptual Framework and Research Questions



1. **Social influence:** does the **star rating** (opinion of others) impact individual rating choices?
 - Prevailing average is endogenous
 - Exploit **discontinuities** in star ratings (rounded to the nearest half)
2. **Culture:** does this effect vary based on reviewers' **cultural** background? Simple Model Motives
 - Compare response of reviewers from different **countries**
 - Focus on **individualism**: values that affect the **speak your mind** vs. **conform** to others trade-off

1. Data
2. Baseline Analysis
3. Determinants of Social Influence
4. Conclusion

1. Data

2. Baseline Analysis

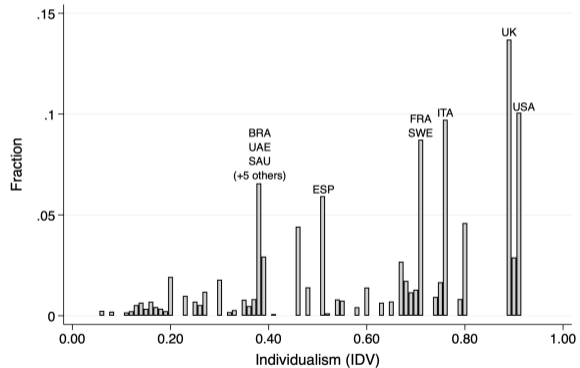
3. Determinants of Social Influence

4. Conclusion

Data: Online Reviews

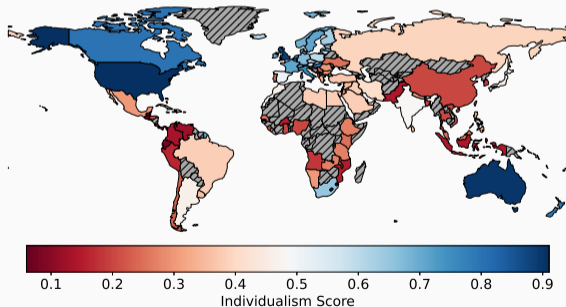
- I web scraped **reviews of restaurants** listed on **Tripadvisor**
 - For each review: i) rating, ii) average held by restaurant, iii) reviewer's country
- Main sample:
 - Period: 2015 to 2019 (stable in terms of cultural background) [Evolution IDV & Reviews](#)
 - Restrict to “frequent” reviewers (less under-reporting) [Histogram](#) [IDV by Type](#)
 - Reviewers from 97 countries [Summary Stats](#)

- **Histogram: by IDV in Reviewer's Country**



Data: Cultural Variation

- **Individualism**: extent to which people feel independent vs. interdependent members groups
 - Psychology: main dimension of cultural variation across countries (Heine, 2010) [More on IDV](#)
 - ↑ individualism associated with ↓ conformity in lab experiments: (Bond & Smith, 1996)
- Use Hofstede (2001) country-level **individualism score** [Questionnaire](#) [Europe](#)
 - High individualism: autonomy, freedom, achievement, **individual choice**
 - Low individualism: group cohesion, social harmony, **conformity**



1. Data
2. Baseline Analysis
3. Determinants of Social Influence
4. Conclusion

Empirical Strategy

- **Challenge:** unobserved factors (restaurant quality) impact the star rating and next review
- **Solution:** exploit **discontinuities** in star ratings
 - Compare reviews submitted when (true) average is just above/below a rounding cutoff
 - Quality of experience is similar, but one's perception of what others think differs by half a star

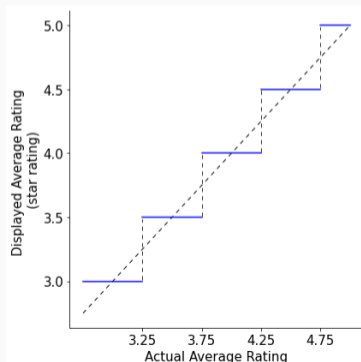
$$\begin{aligned} \text{Rat}_{ijn} = & \beta_0 + (\beta_1 + \beta_2 \text{IDV}_{c(i)}) \times \mathbb{1}\{\text{Avg}_{jn-1} \geq k\} \\ & + \beta_3 \text{IDV}_{c(i)} + \beta_4 \text{Avg}_{jn-1} + \beta_5 (\text{Avg}_{jn-1} \times \text{IDV}_{c(i)}) \\ & + \gamma X_{ijn} + \delta_{\text{city} \times \text{time}} + \eta_j + \epsilon_{ijn} \end{aligned}$$

- **Identification assumption:** determinants of a rating (restaurant and reviewer characteristics) are smooth functions of the underlying average

Reviewers

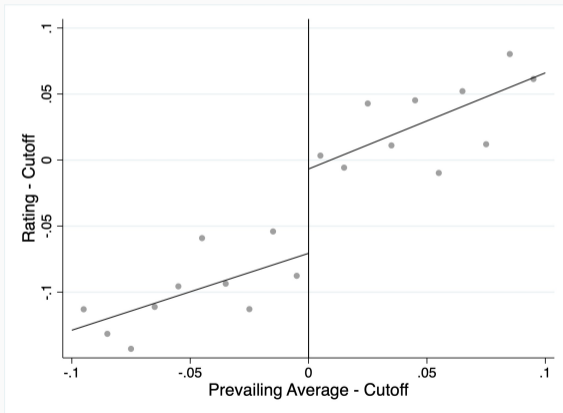
Restaurants

Days

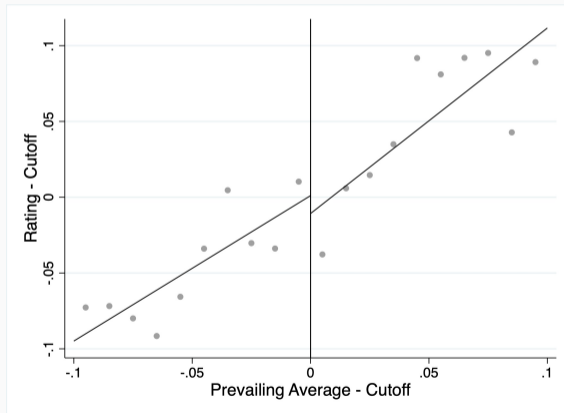


Visual Evidence: Low versus High Individualism

- **Two groups:** below and above median individualism (IDV)
- Pool all cutoffs and plot (normalized) ratings as a function of the prevailing average



(a) Below Median IDV



(b) Above Median IDV

Baseline Results: Linear Effect of Individualism

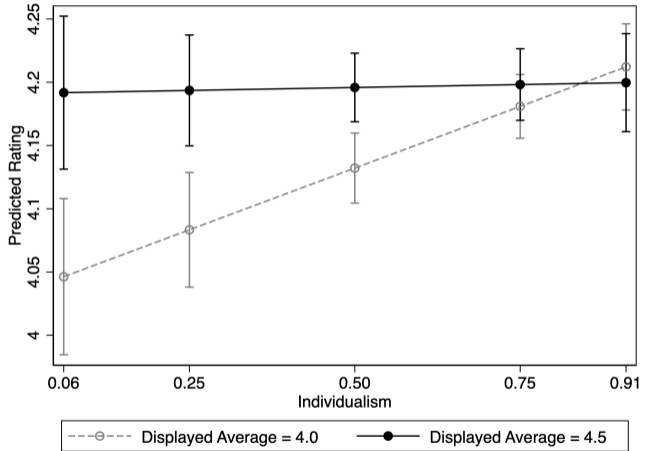
- **Intuition:**

- Consumer reviews a 4.25 restaurant under two scenarios
- Star rating of 4.0 or 4.5
- **Social influence:** difference between **black** and **gray** lines

- \uparrow **individualism** \Rightarrow \downarrow **conformity**

- **Effect** for specific **countries:**

- IDV 0.06 (Guatemala): 0.15
- IDV 0.51 (Spain): 0.06
- IDV 0.91 (United States): -0.01



[Full Table](#)

[Norm. Avg Ratings](#)

[Full Interaction](#)

[By Cutoff](#)

1. Data
2. Baseline Analysis
3. Determinants of Social Influence
4. Conclusion

Other Determinants of Social Influence: Empirical Strategy

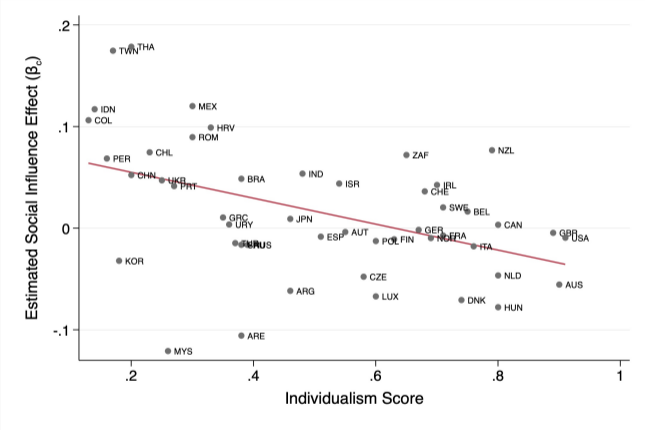
- **Question:** is variation in reviewers' response to the average indeed about cultural values?
 - **Individualism** correlates with other measures of country level heterogeneity (e.g. **income**)
- **Step 1:** estimate country level social influence effects (Combes et al., 2008)

$$\begin{aligned} Rat_{ijn} = & \alpha Avg_{jn-1} + X'_{ijn}\gamma_1 + \theta_{c(i)} + \\ & \left(\beta_{c(i)} + X'_{ijn}\gamma_2 \right) \times \mathbb{1}\{Avg_{jn-1} \geq k\} + \epsilon_{ijn} \end{aligned} \quad (1)$$

- **Step 2:** explain variation in **social influence** β_c using other **country-level** variables

$$\hat{\beta}_c = \kappa + \eta IDV_c + \Gamma' Z_c + \nu_c \quad (2)$$

Estimated Social Influence and Individualism



Notes: only includes countries with 400 reviews or more

Is it Really About Individualism?

	Dependent Variable: Estimated Social Influence (β_c)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Individualism (IDV)	-0.086*** (0.024)					-0.094** (0.036)	-0.120** (0.051)	-0.112** (0.056)	-0.199** (0.081)
Log Income pc		-0.023*** (0.008)				-0.007 (0.017)	0.006 (0.022)	0.005 (0.022)	0.028 (0.028)
Years of Schooling			-0.005** (0.002)			0.001 (0.003)	-0.001 (0.005)	-0.002 (0.005)	0.011 (0.008)
Share Protestant				-0.033* (0.019)		0.011 (0.021)	0.032 (0.052)	0.020 (0.059)	-0.004 (0.089)
Freedom Score					-0.041 (0.033)	0.021 (0.036)	0.006 (0.041)	0.011 (0.042)	-0.012 (0.068)
Share Other Religions	-	-	-	-	-	-	Yes	Yes	Yes
Continent FE	-	-	-	-	-	-	-	Yes	Yes
Observations	74	74	74	74	74	74	74	74	74
R^2	0.151	0.099	0.068	0.019	0.030	0.160	0.211	0.216	0.187
Weighted Reg. ($1/SE_{\beta_c}$)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

- **Social influence**

- The amount of **information** in the star rating **matters** (N of Prev. Reviews)
 - Conformity is more pronounced when the restaurant has more past reviews
- Alternative way to **distinguish conformity** and correlation in **preferences** (Review $n - 1$)
 - Reviewers only conform to preceding review if it is displayed on the screen (same language)

- **Role of culture**

- In a cross-regional analysis **within Italy**, cultural values also impact reviewers' response to the average rating (Italy)
- More specific (narrower) **human values** predict social influence in expected ways
 - Reviewers from countries that value **autonomy conform less**, while those from places that value **obedience conform more** (Schwartz) (WVS) (Hofstede)

1. Data
2. Baseline Analysis
3. Determinants of Social Influence
4. Conclusion

Conclusion

- Previous literature suggests that individualism is linked to lower conformity
- This paper studies the role of **culture** as a driver of **social influence** on **online reviews**
 - Exploited variation from Tripadvisor's rounding of average ratings (majority opinion)
 - Found that reviewers' responses to the prevailing average rating vary across cultures
 - **Higher individualism** \Rightarrow **lower tendency to conform** to the average
- **Implication:** accuracy of **information aggregated** on digital **platforms** can be influenced by the **cultural values** of its users
 - **Social influence** can **impact** the **information** content of reviews
 - Speed of information flow **Convergence**, helpfulness of reviews **Helpfulness**

Current and Future Work

- **Implications:** Quantify the overall effect of individualism on online reputation systems
 - Simplest model suggests that high individualism leads to faster convergence Plot
 - Subsequent consumers seem to derive value from reviews further from the average Helpful Votes
 - But in other scenarios (high variance in consumer experiences) conformity might be efficient
 - When is low or high individualism better for revealing the true quality of a product?
- **Mechanisms:** Does cultural variation in conformity arise from a belief in the accuracy of the majority opinion or a desire to avoid standing out?
 - Review text may help disentangle mechanisms Word Cloud
 - Effect of preceding reviews for different groups of reference $n - 1$ N of Reviews
 - Within-country variation: European subnational regions, United States Map

Culture and Social Influence

Evidence From Online Reviews

Cayruã Chaves Fonseca (Cay)

August 31, 2023

cayrua.chaves@cemfi.edu.es

Appendix

Summary Statistics

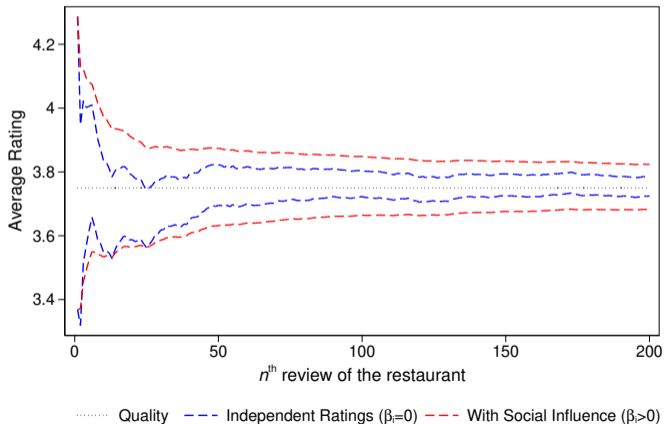
	Reported Ratings		Most Frequent Countries (of Reviewers)			
	Count	Share of Total		Count	Share of Total	IDV
Total	369,457	100%	United Kingdom	50,597	13.69%	0.89
1-star	11,496	3.11%	United States	37,211	10.07%	0.91
2-star	17,427	4.72%	Italy	35,915	9.72%	0.76
3-star	53,543	14.49%	France	27,371	7.41%	0.71
4-star	138,934	37.60%	Spain	21,922	5.93%	0.51
5-star	148,057	40.07%	Brazil	19,229	5.20%	0.38
			Australia	10,689	2.89%	0.90
	Mean	Standard Dev.	Russia	10,591	2.87%	0.39
Reported Rating _n	4.07	1.00	Germany	9,905	2.68%	0.67
Average Stars _{n-1}	4.08	0.42	Canada	8,884	2.40%	0.80
Individualism (IDV)	0.64	0.23	Argentina	8,072	2.18%	0.46
Num. Prior Reviews	308.15	486.48	Japan	7,809	2.11%	0.46
Tourist Dummy	0.54	0.50				
		Unique			Mean N of Reviews	
Reviewers		265,394			1.39	
Restaurants		10,282			35.93	
Country (reviewers)		97			3808.83	
Country (restaurants)		105			3518.64	

Evolution of Average Ratings: Simulation

- Simple model of ratings: consumption experience and influence of past average
- $r_{ijn} = (1 - \beta_i)(q_j + \epsilon_{ijn}) + \beta_i \bar{r}_{jn-1}$ (caveat about ϵ_{ijn})

◀ Conclusions

◀ Next Steps



Hofstede's Questionnaire

- Examples of some of the questions from Hofstede (2001)
- How important is it to you to ... ?
 1. Have challenging work to do—from which you can get a personal sense of accomplishment
 2. Have an opportunity for high earnings
 3. Work with people who cooperate well with one another.
 4. Have considerable freedom to adapt your own approach to the job.
 5. Have an opportunity for advancement to higher-level jobs.
 6. Have a good working relationship with your manager.
 7. Have a job which leaves you sufficient time for your personal or family life.

Previous Literature: “Effects” of Individualism

● Economics literature

◀ Data: Culture

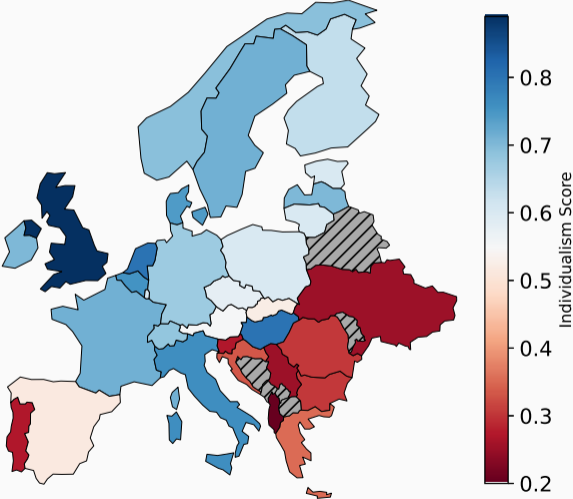
- Innovation and growth (Gorodnichenko & Roland, 2017)
- Individual and policy responses to COVID-19 (Bazzi et al., 2021; C. Chen et al., 2021)
- Management practices (**van2014individualism**)
- Functioning of democracy (**nannicini2013social**)

● Psychology (and behavioral economics)

- Conformity in lab experiments (**bond1996culture**; Asch, 1956)
- Preference for uniqueness (Kim & Markus, 1999)
- Guilty over shame, impersonal fairness, universalist or generalist morality, generalized trust, intentions versus outcomes, positive self-view, love of choice (Henrich, 2020)

Individualism Scores in Europe

World



Why Use Discontinuities in Star Ratings?

- How to estimate the effect of the current average on the next review?
- Cross-section of restaurants:
 - Averages are endogenous: better restaurants have better average ratings
 - Even with no social influence: correlation between average and next review
- Within-restaurant variation:
 - Quality may be time-varying (Dai et al. (2018))
 - Negative correlation between current average and next review
- **Discontinuities:** variation in stars uncorrelated to the quality of the consumption experience
 - Displayed average (stars): proxy for the perception of the opinion of others
- **Intuition:** conditional on a given change in continuous average, what's the additional effect of crossing a rounding cutoff? Baseline Results

Why Use Discontinuities in Star Ratings?

	Dependent Variable: $Rating_n$				
	(1)	(2)	(3)	(4)	(5)
Individualism (IDV)	-0.593*** (0.104)	-0.610*** (0.102)	-0.631*** (0.115)	-0.608*** (0.102)	-0.632*** (0.115)
Continuous Average					
Average Rating	0.628*** (0.017)	0.618*** (0.017)	-0.264*** (0.032)	0.468*** (0.038)	-0.437*** (0.049)
Average Rating \times IDV	0.160*** (0.025)	0.150*** (0.024)	0.156*** (0.027)	0.358*** (0.058)	0.386*** (0.063)
Displayed Average					
Star Rating				0.160*** (0.034)	0.174*** (0.038)
Star Rating \times IDV				-0.208*** (0.052)	-0.231*** (0.056)
Rest. City \times Mon-Yr FE	Yes	Yes	Yes	Yes	Yes
Baseline Covariates	-	Yes	Yes	Yes	Yes
Restaurant FE	-	-	Yes	-	Yes
Observations	369,407	369,407	368,751	369,407	368,751

Standard errors clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Further Connections to the Literature

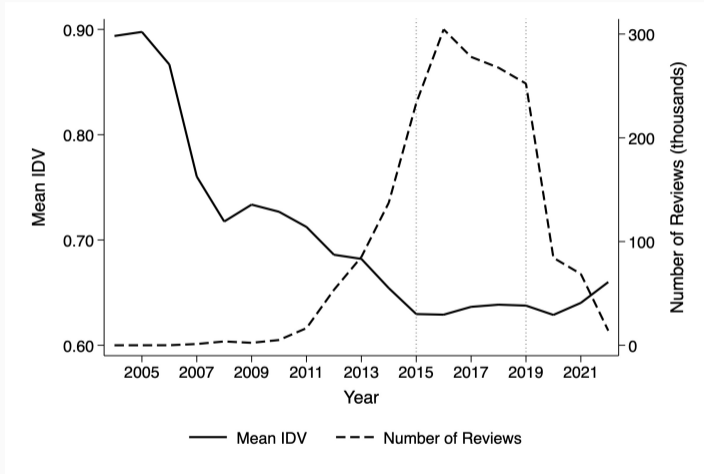
- **Antecedents of reviews**

- Y. Chen et al. (2010): reviewers' own probability of submitting a rating responds to information on the reviewing behavior of other users
- Chen et al. (2018): the value of multidimensional rating systems

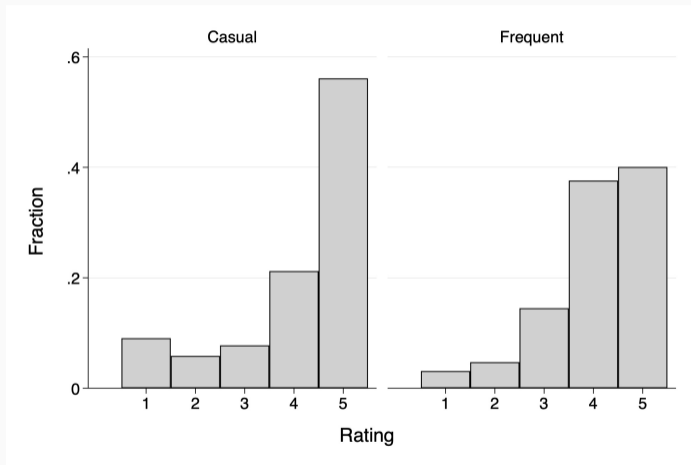
- **Effects of reviews**

- Anderson and Magruder (2012): online reviews on Yelp affect restaurant reservation rates
- **kwark2014onlineempty citation**: effect of review platforms on upstream competition depends on whether consumers use them to learn about quality or match/fit

Sample Period

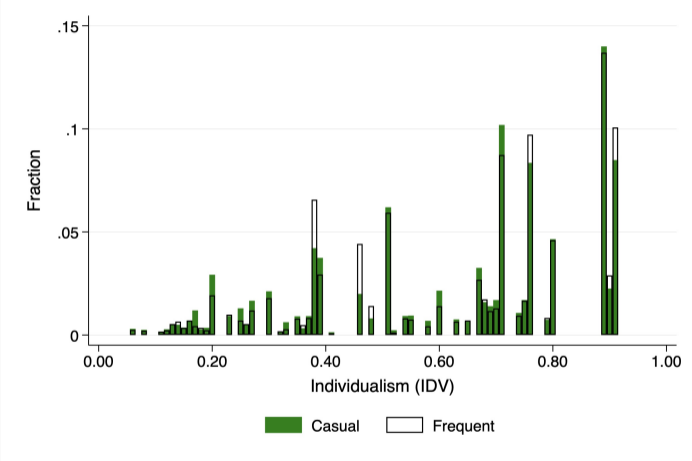


Ratings by Casual vs Frequent Reviewers



Frequent reviewers: more than 20 reviews on Tripadvisor

Distribution of Individualism: Casual vs Frequent



Frequent reviewers: more than 20 reviews on Tripadvisor

A Model of Rating Choice: Setup

- Conditional on leaving a review, choose which rating to report
 - Do not deal explicitly with decision of whether to review
- Restaurant j receives its n^{th} review, submitted by a reviewer from country c
- Before submitting rating r_{jnc} , the reviewer consumes at j and gets utility u_{jnc}
 - $u_{jnc} = q_j + \xi_{jnc}$, with $\xi_{jnc} \sim \mathcal{N}(\mu_c, \sigma_c^2)$
 - q_j : restaurant quality
 - ξ_{jnc} : taste shock with country-specific mean μ_c and variance σ_c^2

Reviewer Motivation

- One way to frame reviewer behavior, two core motivations
- Self-expression motive (Dai et al., 2018)
 - Satisfaction from sharing personal opinion and feelings
 - Motivates reviewers to report a rating equal to their utility
- Social concerns (Y. Chen et al., 2010; Muchnik et al., 2013)
 - Desire to be fair with the restaurant
 - Avoid (seek) disagreement with others
 - In both cases, reviewers are influenced by \tilde{q}_{jnc}
- Choose r_{jnc} to maximize:

$$U(r_{jnc}) = -[(1 - \gamma_c)(u_{jnc} - r_{jnc})^2 + \gamma_c(\tilde{q}_{jnc} - r_{jnc})^2] \quad (3)$$

- γ_c : country-specific relative weight of each motivation
- \tilde{q}_{jnc} : reviewers' perception of the majority opinion

Reported Ratings

- Taking FOC we find the optimal rating

$$r_{jnc} = (1 - \gamma_c)u_{jnc} + \gamma_c\tilde{q}_{jnc} \quad (4)$$

- Weighted average between consumption utility and what others have expressed
 - My empirical strategy assumes that $\tilde{q}_{jnc} = \text{Star Rating}$
 - Moreover, empirical analysis suggests that $u_{jnc} = q_j + \xi_{jnc}$ does not depend on Star Rating once the underlying average is controlled for

Interpretation of Results: Social Influence

- Why would reviewers be influenced by the average rating (opinion of others)?
- Reviewer motivation: extrinsic, intrinsic, image concerns (**benabou2006incentives**)
 - No material incentives: extrinsic motives play no role
 - **Intrinsic motivation**: contribute to a public good (information)
 - Reviewers may use the opinion of others in order to be more “accurate”
 - **Image-related concerns**: care about what others will think of my opinion
 - There may be a psychological cost (or benefit) of being perceived as “different”
- Individualism (“cultural package”) correlates with different psychological traits that may explain variation in responses to the previous average
 - Positive self-view, love of choice, “stand out” rather than “fit in” (Henrich, 2020)

Interpretation of Results: Cultural Differences

- **Question:** why do reviewers from cultures with different levels of individualism exhibit different responses to the previous average? Framework
- Individualism (“cultural package”) correlates with different psychological traits that may explain variation in responses to the previous average
 - Positive self-view, love of choice, “stand out” rather than “fit in” (Henrich, 2020)
- Examples of how these traits shape the core motivations of reviewers:
 - Positively biased self-view \Rightarrow my opinion is correct \Rightarrow less reliance on average
 - “Stand out” or “fit in” \Rightarrow psychological payoff of submitting rating different than the average

Reviewer Characteristics

	Individualism	Tourist (abroad)	Ln User Reviews	Smartphone
Sample: Pooled Cutoffs				
Above Cutoff	-0.0028 (0.0025)	-0.0106 (0.0200)	-0.0060 (0.0208)	-0.0035 (0.0093)
Above Cutoff × IDV		0.0172 (0.0285)	0.0203 (0.0271)	0.0009 (0.0122)
Cutoff FE	Yes	Yes	Yes	Yes
Rest. City x Month-Year FE	Yes	Yes	Yes	Yes
Observations	142,206	142,206	142,206	142,206

Standard errors are clustered at the restaurant level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Strategy

Restaurant Characteristics

	Age (months)	Manages Page	Price Category	Ln Reviews
Sample: Pooled Cutoffs				
Above Cutoff	1.0586 (1.6159)	-0.0055 (0.0339)	-0.0136 (0.0219)	-0.0173 (0.0735)
Above Cutoff × IDV	0.3002 (2.3103)	0.0246 (0.0425)	0.0229 (0.0288)	-0.0947 (0.0926)
Cutoff FE	Yes	Yes	Yes	Yes
Rest. City × Month-Year FE	Yes	Yes	Yes	Yes
Observations	142,206	142,206	142,206	142,206

Standard errors are clustered at the restaurant level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Empirical Strategy

Days to Next Review (Frequent Reviewers)

Dependent variable: log of number of days between reviews to the same restaurant (frequent reviewers only)

	Pooled Cutoffs				4.25 Cutoff			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Above Cutoff	0.002 (0.014)	0.002 (0.011)	0.002 (0.011)	0.015 (0.019)	0.005 (0.019)	0.003 (0.016)	0.003 (0.016)	0.024 (0.026)
Average Rating	-0.311** (0.121)	-0.477*** (0.108)	-0.477*** (0.108)	-0.478*** (0.108)	-0.260 (0.169)	-0.665*** (0.157)	-0.665*** (0.157)	-0.668*** (0.157)
Ln Previous Reviews	-0.491*** (0.005)	-0.346*** (0.015)	-0.346*** (0.015)	-0.346*** (0.015)	-0.490*** (0.007)	-0.409*** (0.027)	-0.409*** (0.027)	-0.409*** (0.027)
Individualism (IDV)			-0.010 (0.013)	0.000 (0.017)			0.006 (0.017)	0.021 (0.024)
Above Cutoff × IDV				-0.020 (0.023)				-0.031 (0.031)
Cutoff FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rest. City × Mon-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Restaurant FE	-	Yes	Yes	Yes	-	Yes	Yes	Yes
Observations	142,206	140,963	140,963	140,963	75,598	74,914	74,914	74,914

Standard errors clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Empirical Strategy

Casual Reviewers

Days to Next Review (Frequent vs Casual Reviewers)

Dependent variable: log of number of days between reviews to the same restaurant (4.25 cutoff only)

	Frequent Reviewers (> 20)				Casual Reviewers (\leq 20)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Above Cutoff	0.005 (0.019)	0.003 (0.016)	0.003 (0.016)	0.024 (0.026)	-0.081*** (0.025)	-0.071*** (0.024)	-0.071*** (0.024)	-0.079** (0.039)
Average Rating	-0.260 (0.169)	-0.665*** (0.157)	-0.665*** (0.157)	-0.668*** (0.157)	0.220 (0.223)	-0.123 (0.230)	-0.122 (0.230)	-0.121 (0.230)
Ln Previous Reviews	-0.490*** (0.007)	-0.409*** (0.027)	-0.409*** (0.027)	-0.409*** (0.027)	-0.469*** (0.009)	-0.341*** (0.035)	-0.341*** (0.035)	-0.341*** (0.035)
Individualism (IDV)			0.006 (0.017)	0.021 (0.024)			-0.012 (0.028)	-0.018 (0.038)
Above Cutoff \times IDV				-0.031 (0.031)				0.012 (0.049)
Cutoff FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rest. City \times Mon-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Restaurant FE	-	Yes	Yes	Yes	-	Yes	Yes	Yes
Observations	75,598	74,914	74,914	74,914	32,333	31,416	31,416	31,416

Standard errors clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Baseline Results: Full Table

	All Cutoffs Pooled				4.25 Cutoff			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Main Effects								
Above Cutoff	0.072*** (0.018)	0.073*** (0.018)	0.086*** (0.020)	0.073*** (0.018)	0.075*** (0.025)	0.074*** (0.024)	0.105*** (0.028)	0.119*** (0.042)
Above Cutoff × IDV	-0.095*** (0.024)	-0.095*** (0.024)	-0.079*** (0.027)	-0.095*** (0.024)	-0.105*** (0.032)	-0.103*** (0.031)	-0.105*** (0.035)	-0.172*** (0.064)
Main Controls								
Individualism (IDV)	0.129*** (0.019)	0.080*** (0.019)	0.076*** (0.021)	-0.602*** (0.152)	0.158*** (0.025)	0.125*** (0.025)	0.134*** (0.027)	-2.743 (2.276)
Average Rating	0.664*** (0.096)	0.652*** (0.095)	-1.121*** (0.118)	0.547*** (0.098)	0.710*** (0.133)	0.675*** (0.133)	-1.447*** (0.168)	0.234 (0.359)
Average Rating × IDV				0.167*** (0.036)				0.683 (0.542)
Additional Controls								
Tourist		0.129*** (0.008)	0.147*** (0.009)	0.127*** (0.008)		0.102*** (0.010)	0.115*** (0.012)	0.102*** (0.010)
Ln Num. Reviews on Trip. (user)		-0.035*** (0.003)	-0.034*** (0.003)	-0.035*** (0.003)		-0.052*** (0.004)	-0.054*** (0.004)	-0.052*** (0.004)
Smartphone		-0.030*** (0.006)	-0.025*** (0.006)	-0.030*** (0.006)		-0.017** (0.007)	-0.012* (0.007)	-0.017** (0.007)
Price: High		0.094*** (0.014)		0.094*** (0.014)		0.068*** (0.017)		0.068*** (0.017)
Ln Prior Reviews (restaurant)		0.014*** (0.003)	-0.029** (0.014)	0.015*** (0.003)		0.021*** (0.004)	-0.009 (0.025)	0.021*** (0.004)
Cutoff FE	Yes	Yes	Yes	Yes	No	No	No	No
Rest. City × Month-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Restaurant FE	No	No	Yes	No	No	No	Yes	No
Observations	142,206	142,206	140,963	142,206	75,598	75,598	74,914	75,598

Standard errors are clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Main Effect

Results: Average Ratings as Distance to Cutoff

	All Cutoffs Pooled				4.25 Cutoff			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Main Effects								
Above Cutoff	0.072*** (0.018)	0.073*** (0.018)	0.100*** (0.031)	0.146*** (0.033)	0.075*** (0.025)	0.074*** (0.024)	0.119*** (0.042)	0.154*** (0.045)
Above Cutoff × IDV	-0.095*** (0.024)	-0.095*** (0.024)	-0.136*** (0.048)	-0.173*** (0.050)	-0.105*** (0.032)	-0.103*** (0.031)	-0.172*** (0.064)	-0.180*** (0.067)
Main Controls								
Individualism (IDV)	0.129*** (0.019)	0.080*** (0.019)	0.102*** (0.029)	0.124*** (0.031)	0.158*** (0.025)	0.125*** (0.025)	0.161*** (0.038)	0.173*** (0.040)
Average Rating	0.664*** (0.096)	0.652*** (0.095)	0.390 (0.260)	-1.740*** (0.288)	0.710*** (0.133)	0.675*** (0.133)	0.234 (0.359)	-1.950*** (0.399)
Average Rating × IDV			0.408 (0.397)	0.968** (0.428)			0.683 (0.542)	0.785 (0.583)
Additional Controls	-	Yes	Yes	Yes	-	Yes	Yes	Yes
Cutoff FE	Yes	Yes	Yes	Yes	-	-	-	-
Rest. City × Mon-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Restaurant FE	-	-	-	Yes	-	-	-	Yes
Observations	142,206	142,206	142,206	140,963	75,598	75,598	75,598	74,914

Standard errors clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Results: Full Interaction Model

	Pooled Cutoffs				4.25 Cutoff			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Above Cutoff	0.073*** (0.018)	0.100*** (0.031)	0.100*** (0.031)	0.148*** (0.033)	0.074*** (0.024)	0.119*** (0.042)	0.125*** (0.042)	0.161*** (0.045)
Above Cutoff × IDV	-0.095*** (0.024)	-0.136*** (0.048)	-0.136*** (0.048)	-0.174*** (0.050)	-0.103*** (0.031)	-0.172*** (0.064)	-0.179*** (0.064)	-0.188*** (0.067)
Individualism (IDV)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avg. Rating	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avg. Rating × IDV	-	Yes	Yes	Yes	-	Yes	Yes	Yes
Avg. Rating × Above Cutoff	-	-	Yes	Yes	-	-	Yes	Yes
Avg. Rating × Above Cutoff × IDV	-	-	Yes	Yes	-	-	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rest. City × Mon-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cutoff FE	Yes	Yes	Yes	Yes	-	-	-	-
Restaurant FE	-	-	-	Yes	-	-	-	Yes
Observations	142,206	142,206	142,206	140,963	75,598	75,598	75,598	74,914

Standard errors clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Main Effect

Results by Cutoff

	All Cutoffs		3.75 Cutoff		4.25 Cutoff		4.75 Cutoff	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Above Cutoff	0.100*** (0.031)	0.146*** (0.033)	0.121* (0.063)	0.160** (0.069)	0.119*** (0.042)	0.154*** (0.045)	0.024 (0.101)	0.099 (0.109)
Above Cutoff × IDV	-0.136*** (0.048)	-0.173*** (0.050)	-0.132 (0.101)	-0.146 (0.107)	-0.172*** (0.064)	-0.180*** (0.067)	0.019 (0.145)	-0.096 (0.156)
Individualism (IDV)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avg. Rating	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avg. Rating × IDV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rest. City × Mon-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cutoff FE	Yes	Yes	-	-	-	-	-	-
Restaurant FE	-	Yes	-	Yes	-	Yes	-	Yes
Observations	142,206	140,963	39,867	39,218	75,598	74,914	14,271	13,877

Standard errors clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Main Effect

Robustness: Placebo Cutoff

	Pooled (Placebo) Cutoffs				4.1 Cutoff			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Above Cutoff	-0.001 (0.018)	-0.004 (0.030)	0.002 (0.030)	0.007 (0.032)	0.005 (0.025)	0.008 (0.042)	0.013 (0.041)	0.025 (0.044)
Above Cutoff × IDV	0.003 (0.023)	0.007 (0.044)	-0.000 (0.044)	0.024 (0.046)	0.015 (0.032)	0.009 (0.063)	0.004 (0.062)	0.013 (0.066)
Individualism (IDV)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avg. Rating	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avg. Rating × IDV	-	Yes	Yes	Yes	-	Yes	Yes	Yes
Avg. Rating × Above Cutoff	-	-	Yes	Yes	-	-	Yes	Yes
Avg. Rating × Above Cutoff × IDV	-	-	Yes	Yes	-	-	Yes	Yes
Rest. City × Mon-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cutoff FE	Yes	Yes	Yes	Yes	-	-	-	-
Restaurant FE	-	-	-	Yes	-	-	-	Yes
Observations	154,907	154,907	154,907	153,738	78,065	78,065	78,065	77,346

Standard errors clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Robustness: Bandwidth Size

	Bandwidth Size				
	0.050	0.075	0.100	0.125	0.150
Above Cutoff	0.061** (0.027)	0.055** (0.021)	0.072*** (0.018)	0.064*** (0.016)	0.059*** (0.015)
Above Cutoff \times IDV	-0.100*** (0.035)	-0.083*** (0.028)	-0.095*** (0.024)	-0.085*** (0.021)	-0.076*** (0.019)
Individualism (IDV)	-0.916*** (0.223)	-0.799*** (0.183)	-0.583*** (0.155)	-0.587*** (0.139)	-0.606*** (0.128)
Average Rating	0.649** (0.285)	0.670*** (0.153)	0.555*** (0.099)	0.598*** (0.074)	0.597*** (0.058)
Average Rating \times IDV	0.258*** (0.053)	0.224*** (0.044)	0.174*** (0.037)	0.171*** (0.033)	0.174*** (0.031)
Cutoff FE	Yes	Yes	Yes	Yes	Yes
Rest. City \times Month-Year FE	Yes	Yes	Yes	Yes	Yes
Restaurant FE	No	No	No	No	No
Observations	67,747	105,152	142,206	178,697	214,146

Robustness: Effect of Underlying Average Rating

	Linear Avg_{ijn}		Quadratic Avg_{ijn}	
	(1)	(2)	(3)	(4)
Above Cutoff	0.0730*** (0.0179)	0.0733*** (0.0179)	0.0731*** (0.0179)	0.0608*** (0.0221)
Above Cutoff \times IDV	-0.0945*** (0.0237)	-0.0944*** (0.0237)	-0.0945*** (0.0237)	-0.0944*** (0.0237)
Running Var. \times Above Cutoff	No	Yes	No	Yes
Cutoff FE	Yes	Yes	Yes	Yes
Rest. City \times Month-Year FE	Yes	Yes	Yes	Yes
Observations	142,206	142,206	142,206	142,206
Sample	All Cutoffs	All Cutoffs	All Cutoffs	All Cutoffs

Standard errors clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Robustness: Discrete Outcomes

	Ordered Probit		Ordered Logit	
	(1)	(2)	(3)	(4)
Discontinuity Effects				
Above Cutoff	0.079*** (0.020)	0.077*** (0.028)	0.130*** (0.035)	0.126*** (0.048)
Above Cutoff × IDV	-0.108*** (0.027)	-0.113*** (0.037)	-0.175*** (0.047)	-0.189*** (0.062)
Selected Controls				
Avg Rating	0.805*** (0.154)	0.859*** (0.208)	1.440*** (0.261)	1.583*** (0.353)
Average Rating × Above Cutoff	0.134 (0.214)	0.282 (0.304)	0.150 (0.362)	0.355 (0.506)
Individualism (IDV)	0.106*** (0.023)	0.160*** (0.030)	0.200*** (0.038)	0.308*** (0.051)
Cutoff FE	Yes	No	Yes	No
Restaurant City FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Observations	142,434	76,100	142,434	76,100
Sample	All Cutoffs	4.25 Cutoff	All Cutoffs	4.25 Cutoff

Standard errors are clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Robustness: Reviewer Activity Level

	User Number of Reviews				
	All	5+	10+	20+	40+
Above Cutoff	0.034** (0.016)	0.038** (0.016)	0.051*** (0.017)	0.073*** (0.018)	0.075*** (0.020)
Above Cutoff \times IDV	-0.034 (0.021)	-0.041* (0.021)	-0.060*** (0.022)	-0.095*** (0.024)	-0.108*** (0.026)
Cutoff FE	Yes	Yes	Yes	Yes	Yes
Rest. City \times Month-Year FE	Yes	Yes	Yes	Yes	Yes
Restaurant FE	No	No	No	No	No
Observations	209,280	183,030	166,658	142,206	109,847

Standard errors are clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Robustness: Sample Choices

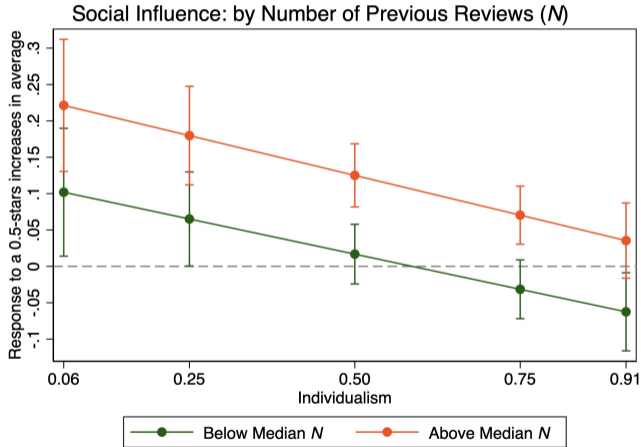
	Main Sample	+ All Years	+ All n	+ Casual Users
Panel A: Pooled Cutoffs				
Above Cutoff	0.073*** (0.018)	0.052*** (0.016)	0.059*** (0.017)	0.034** (0.016)
Above Cutoff \times IDV	-0.095*** (0.024)	-0.072*** (0.021)	-0.074*** (0.023)	-0.034 (0.021)
Cutoff FE	Yes	Yes	Yes	Yes
Rest. City \times Month-Year FE	Yes	Yes	Yes	Yes
Observations	142,206	190,037	154,112	209,280
Panel B: 4.25 Cutoff				
Above Cutoff	0.074*** (0.024)	0.052** (0.022)	0.063*** (0.023)	0.030 (0.023)
Above Cutoff \times IDV	-0.103*** (0.031)	-0.073*** (0.028)	-0.093*** (0.030)	-0.038 (0.028)
Rest. City \times Month-Year FE	Yes	Yes	Yes	Yes
Observations	75,598	99,110	79,812	102,583

Standard errors are clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Effect of Reviewer and Restaurant Characteristics

	Dependent Variable: Rating r_{ijn}					
	(1)	(2)	(3)	(4)	(5)	(6)
Above Cutoff	0.164*** (0.0463)	0.148*** (0.0468)	0.166*** (0.0471)	0.151*** (0.0544)	0.119** (0.0546)	0.134** (0.0552)
Role of Culture						
Above Cutoff × IDV	-0.102*** (0.0312)	-0.108*** (0.0305)	-0.115*** (0.0315)	-0.0986*** (0.0353)	-0.109*** (0.0354)	-0.114*** (0.0363)
Reviewer i Characteristics						
Above Cutoff × Ln User Reviews	-0.0210*** (0.00691)	-0.0201*** (0.00690)	-0.0208*** (0.00688)	-0.0188*** (0.00720)	-0.0184** (0.00718)	-0.0190*** (0.00717)
Restaurant j Characteristics						
Above Cutoff × Prior Reviews		0.0000849** (0.0000423)	0.0000870** (0.0000421)		0.000234*** (0.0000531)	0.000238*** (0.0000530)
Above Cutoff × Rest. Reviews sq.		-2.89e-08** (1.45e-08)	-2.89e-08** (1.40e-08)		-7.57e-08*** (1.22e-08)	-7.43e-08*** (1.22e-08)
Reviewer-Rest. ij Characteristics						
Above Cutoff × Tourist			0.00625 (0.0160)			0.00193 (0.0189)
Above Cutoff × Smartphone			-0.0214 (0.0140)			-0.0246* (0.0143)
Rest. City × Month-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Restaurant FE	No	No	No	Yes	Yes	Yes
Sample	4.25 cutoff	4.25 cutoff	4.25 cutoff	4.25 cutoff	4.25 cutoff	4.25 cutoff
Observations	75,598	75,598	75,598	74,914	74,914	74,914

Effect by Restaurants' Number of Previous Reviews (N)



Two interpretations [◀ Additional Analyses](#)

1. Others are correct and I want to be accurate
2. I am correct but I do not want to appear foolish in the eyes of others

Work in progress: [◀ Next Steps](#)

- Image-concerns: group of reference

Effect of Reviewer and Restaurant Characteristics

	Dependent Variable: Rating r_{ijn}					
	(1)	(2)	(3)	(4)	(5)	(6)
Role of Culture						
Above Cutoff \times Individualism	-0.104*** (0.0318)	-0.102*** (0.0312)	-0.103*** (0.0316)	-0.102*** (0.0353)	-0.100*** (0.0354)	-0.107*** (0.0357)
Reviewer (Static) Characteristics						
Above Cutoff \times Female	-0.00993 (0.0238)	-0.0106 (0.0237)	-0.0114 (0.0237)	-0.0221 (0.0241)	-0.0222 (0.0241)	-0.0225 (0.0241)
Above Cutoff \times Male	-0.00468 (0.0228)	-0.00457 (0.0227)	-0.00580 (0.0227)	-0.0107 (0.0230)	-0.0108 (0.0230)	-0.0119 (0.0229)
Restaurant (Static) Characteristics						
Above Cutoff \times Price: Medium		0.00542 (0.0236)	0.00539 (0.0234)		0.0443 (0.0358)	0.0441 (0.0354)
Above Cutoff \times Price: High		0.00209 (0.0285)	0.00292 (0.0290)		0.0501 (0.0449)	0.0470 (0.0451)
Reviewer-Rest. (Time-Varying) Charac.						
Above Cutoff \times Share 1-star or 2-star			-0.313 (0.308)			-0.221 (0.403)
Above Cutoff \times Share Same Country			-0.0225 (0.0268)			-0.0119 (0.0351)
Rest. City \times Month-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Restaurant FE	No	No	No	Yes	Yes	Yes
Sample	4.25 cutoff	4.25 cutoff	4.25 cutoff	4.25 cutoff	4.25 cutoff	4.25 cutoff
Observations	75,598	75,598	75,598	74,914	74,914	74,914

Effect of the Preceding Review

Dependent Variable: Review n

	(1)	(2)	(3)	(4)	(5)
Review (n-1)	0.126*** (0.004)	0.023*** (0.003)	0.017*** (0.003)	-0.005 (0.004)	-0.004 (0.004)
Review (n-1) × Same Country			0.020*** (0.006)		-0.016 (0.015)
Review (n-1) × Same Language				0.048*** (0.005)	0.045*** (0.006)
Review (n-1) × Same Country & Lang.					0.019 (0.016)
Month-Year FE	Yes	Yes	Yes	Yes	Yes
Reviewer Country FE	Yes	Yes	Yes	Yes	Yes
Restaurant Age FE	Yes	Yes	Yes	Yes	Yes
Restaurant FE	-	Yes	Yes	Yes	Yes
Observations	142,434	141,223	141,223	141,223	141,223

Standard errors clustered at the restaurant level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

For all interaction terms, main effects are also included.

[◀ Additional Analyses](#)

[◀ Next Steps](#)

Predictors of the Variability of Ratings

	Dependent Variable: Squared Residuals of $r_{ijt} = \delta_{city \times t} + \eta_j + \epsilon_{ijt}$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Individualism (IDV)	0.093*** (0.011)	0.114*** (0.012)	0.122*** (0.012)	0.120*** (0.012)	0.086*** (0.016)	0.072*** (0.025)	0.051 (0.033)
National Tourist		-0.104*** (0.008)	-0.102*** (0.008)	-0.104*** (0.008)	-0.104*** (0.008)	-0.083*** (0.013)	-0.095*** (0.018)
International Tourist		-0.137*** (0.007)	-0.132*** (0.007)	-0.134*** (0.007)	-0.134*** (0.007)	-0.124*** (0.011)	-0.124*** (0.014)
Ln Reviews on Trip. (user)		-0.262*** (0.005)	-0.264*** (0.005)	-0.267*** (0.005)	-0.268*** (0.005)	-0.267*** (0.008)	-0.241*** (0.010)
Ln helpful Votes		0.165*** (0.004)	0.166*** (0.004)	0.167*** (0.004)	0.168*** (0.004)	0.169*** (0.007)	0.166*** (0.009)
Ln Prior Reviews (restaurant)			-0.011*** (0.002)	-0.028*** (0.003)	-0.028*** (0.003)	-0.030*** (0.004)	0.010 (0.006)
Power Distance					-0.064*** (0.020)	-0.079** (0.032)	-0.111*** (0.043)
Observations	369,457	369,457	369,457	369,457	369,457	142,434	76,100
Sample	Main	Main	Main	Main	Main	All Cutoffs	4.25 Cutoff

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Hofstede's Dimensions of National Culture

1. **Individualism:** people feel as independent/bounded entities
2. **Power distance:** acceptance that power is unequally distributed
3. **Femininity-masculinity:** gender roles are clearly distinct
4. **Uncertainty avoidance:** anxiety in ambiguous situations / prefer stable habits and rituals
5. **Long-term orientation:** world is in flux and preparing for the future is always needed
6. **Indulgence:** follow your impulses, friends are important, life is good and makes sense

Table

Alternative Cultural Measures: WVS

	Dependent Variable: Estimated Social Influence (in std dev.)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Individualism (std)	-0.024*** (0.005)				-0.022*** (0.005)	-0.022*** (0.005)	-0.024*** (0.006)	-0.025*** (0.005)
WVS Obedience (std)		0.017** (0.007)			0.011** (0.005)			0.009 (0.007)
WVS Family Ties (std)			0.017** (0.006)			0.011** (0.005)		0.011 (0.007)
WVS Trust (std)				-0.013** (0.006)			0.000 (0.005)	0.010* (0.006)
Observations	65	65	65	65	65	65	65	65
R^2	0.282	0.093	0.095	0.073	0.316	0.320	0.282	0.349
Weighted Reg. ($1/SE_{\beta_c}$)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Alternative Cultural Measures: Schwartz Model

- Survey of school teachers and college students across 78 countries
- *Autonomy* (similar to IDV) predicts lower conformity on Tripadvisor

	Dependent Variable: Estimated Social Influence (β_c)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intellectual Autonomy (std)	-0.014** (0.006)		-0.011 (0.008)		-0.007** (0.004)		-0.010** (0.004)
Affective Autonomy (std)		-0.016** (0.007)	-0.010 (0.009)			0.004 (0.006)	0.010 (0.007)
Hofstede Individualism (std)				-0.026*** (0.005)	-0.024*** (0.005)	-0.028*** (0.006)	-0.028*** (0.005)
Observations	58	58	58	58	58	58	58
R^2	0.099	0.083	0.124	0.320	0.343	0.323	0.359

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Hofstede's Dimensions of Culture

	Dependent Variable: Estimated Social Influence (β_c)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Individualism (IDV)	-0.103*** (0.024)						-0.131*** (0.028)	-0.137** (0.064)
Power Distance		0.078** (0.037)					0.040 (0.049)	0.017 (0.086)
Femininity - Masculinity			-0.000 (0.028)				0.035* (0.020)	0.016 (0.040)
Uncertainty Avoidance				0.008 (0.023)			-0.053 (0.034)	-0.015 (0.051)
Long-Term Orientation					-0.025 (0.032)		0.018 (0.032)	-0.015 (0.060)
Restraint - Indulgence						0.032 (0.035)	0.089*** (0.033)	0.093 (0.076)
Observations	68	68	68	68	68	68	68	68
R^2	0.219	0.076	0.000	0.001	0.010	0.013	0.337	0.188
Weighted Reg. ($1/SE_{\beta_c}$)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

◀ Additional Analyses

Correlates of Individualism

	Dependent Variable: Individualism (IDV)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Income pc	0.178*** (0.024)				0.095*** (0.021)	0.092*** (0.026)	0.104*** (0.022)	0.157*** (0.029)
Years of Schooling		0.062*** (0.007)			0.034*** (0.011)	0.038*** (0.014)	0.031* (0.016)	0.010 (0.013)
Share Protestant			0.499*** (0.088)		0.235*** (0.072)	0.178 (0.125)	0.024 (0.111)	-0.167 (0.116)
Freedom Score				0.443*** (0.072)	-0.026 (0.089)	0.052 (0.102)	-0.046 (0.088)	0.032 (0.081)
Share Other Religions	-	-	-	-	-	Yes	Yes	Yes
Continent FE	-	-	-	-	-	-	Yes	Yes
Observations	74	74	74	74	74	74	74	74
R^2	0.441	0.447	0.232	0.275	0.571	0.632	0.741	0.853
Weighted Reg. ($1/SE_{\beta_c}$)	-	-	-	-	-	-	-	Yes

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Basic Controls

Historical Determinants of Individualism

- Cultural values and norms evolve over long period of time
- Two of the leading historical determinants of today's variation in individualism are
 1. Exposure to pathogenic diseases (Fincher et al., 2008)
 - Making sharp distinctions between in-group and out-group members inhibits exposure to novel pathogens (e.g. wary of contact with foreigners)
 - Conforming to traditions/norms (food preparation) reduces pathogen transmission
 - Prediction: \uparrow exposure to pathogens \Rightarrow \downarrow individualism
 2. Medieval Catholic Church (Schulz et al., 2019; Henrich, 2020)
 - Our psychology is shaped by the social norms we encounter growing up: intensive kinship norms reward greater conformity
 - Church undermined Europe's intensive kin-based institutions in the Middle Ages (e.g. banning cousin marriage)
 - Prediction: \uparrow exposure to medieval Church \Rightarrow \downarrow kinship intensity \Rightarrow \uparrow individualism

Historical Determinants of Individualism

	Dep. Var: Individualism (std)				Dep. Var: Social Influence (std)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Individualism (std)					-0.220*** (0.059)	-0.144** (0.062)	-0.201** (0.083)	-0.206*** (0.071)	-0.146* (0.075)
Parasite Stress (std)	-0.772*** (0.122)			-0.322** (0.132)		0.120* (0.064)			0.139 (0.099)
Exposure to Catholic Church (std)		0.695*** (0.081)		0.499*** (0.071)			-0.023 (0.071)		0.003 (0.066)
Latitude			0.017*** (0.006)	0.005 (0.005)				-0.001 (0.003)	0.001 (0.004)
Observations	76	76	76	76	76	76	76	76	76
R^2	0.485	0.550	0.215	0.658	0.152	0.171	0.153	0.154	0.172

Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Why Look at Within-Country Variation?

- General concern: countries vary in many dimensions (omitted variable bias)
- Specific concerns:
 - Reviewers use the platform in different languages
 - Tripadvisor may “mean” different things in different countries
 - Reviewers from the US: 72% of reviews are written by tourists
 - Reviewers from Italy: this number is of about 50%
 - Popularity of Yelp in the US
- Mitigate these concerns: restrict analysis to Italians only
 - Large variation in cultural values
 - Data on cultural values available at regional level (20 regions)
 - Conformity-index from Schulz et al. (2019)

Specification

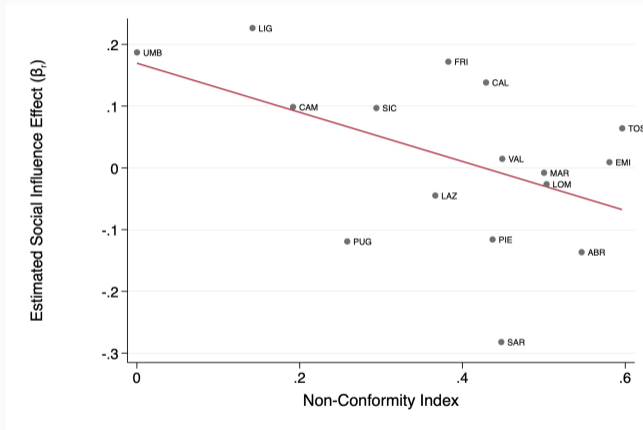
- Same specification used in the cross-country analysis
- Step 1: estimate region-level social influence

$$\begin{aligned} Rat_{ijn} = & \alpha Avg_{jn-1} + X'_{ijn}\gamma_1 + \theta_{r(i)} + \\ & \left(\beta_{r(i)} + X'_{ijn}\gamma_2 \right) \times \mathbb{1}\{Avg_{jn-1} \geq k\} + \epsilon_{ijn} \end{aligned} \quad (5)$$

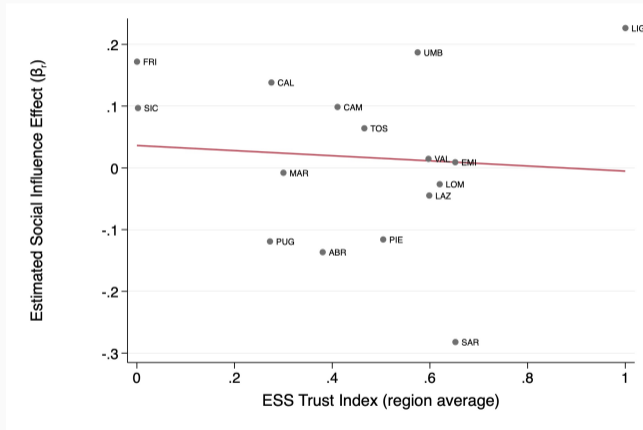
- Step 2: test whether conformity-index $Conf_r$ predicts β_r

$$\hat{\beta}_r = \kappa + \delta (1 - Conf_r) + \nu_r \quad (6)$$

Social Influence and Non-Conformity Index



Social Influence and Trust Index



Measuring Inclination to Conform

- Conformity index computed by Schulz et al. (2019)
- ESS respondents rate extent to which they agree with:
 - i Proper behavior: avoid doing anything people would say is wrong
 - ii Follow orders: follow rules at all times, even when nobody is watching
 - iii Modesty: try not to draw attention to herself/himself
 - iv Tradition: follow customs handed down by her/his religion or family
- I take averages over ESS respondents from the same NUTS 2 region
 - Able to compute conformity index for 20 Italian regions
- Linking regional conformity index to Tripadvisor data
 - 96% of Italian reviewers report their city of residence

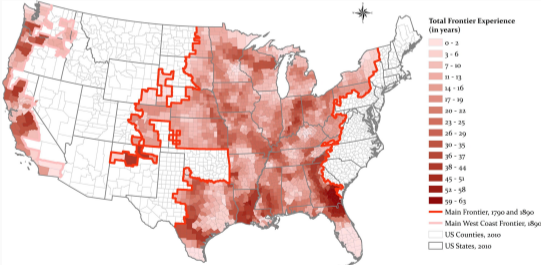
Mean and Variance of Ratings by Reviewers' Country

	Dependent Variable: Mean Rating				Dependent Variable: Variance of Ratings			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Individualism	-0.018 (0.049)	-0.067 (0.056)	-0.062 (0.060)	-0.058 (0.061)	0.182*** (0.045)	0.112 (0.074)	0.094 (0.079)	0.094 (0.080)
Years of Schooling		0.007 (0.005)	0.007 (0.005)	0.016** (0.006)		0.009 (0.008)	0.007 (0.008)	0.008 (0.009)
Log Income pc			-0.003 (0.020)	0.002 (0.019)			0.013 (0.017)	0.013 (0.018)
Freedom Score				-0.135** (0.059)				-0.015 (0.052)
Observations	79	79	79	79	79	79	79	79
R^2	0.002	0.019	0.019	0.091	0.129	0.152	0.157	0.158

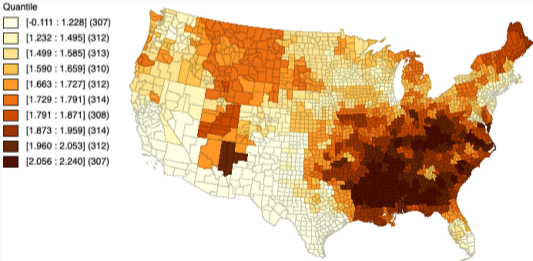
Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Distribution of Individualism in the United States

- Previous literature: county-level measures of individualism across the US
- Through “frontier experience” (left) or migration patterns (right)



(a) `bazzi2020frontierempty` citation



(b) C. Chen et al. (2021)

Word Frequency by Reviewer Country



(a) United States



(b) Spain

What Makes a Review Helpful?

	Dependent Variable: Log of Number of Helpful Votes							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rating Deviation	0.087*** (0.005)	0.075*** (0.004)	0.075*** (0.004)	0.075*** (0.004)	0.067*** (0.004)	0.068*** (0.004)	0.067*** (0.004)	0.064*** (0.004)
Rating		-0.002 (0.004)	-0.003 (0.004)	-0.003 (0.004)	-0.007* (0.004)	-0.007* (0.004)	-0.007* (0.004)	-0.021*** (0.004)
Ln Review Length		0.080*** (0.005)	0.079*** (0.005)	0.079*** (0.005)	0.078*** (0.005)	0.076*** (0.005)	0.076*** (0.005)	0.062*** (0.004)
Ln Review Order (n^{th})			0.022*** (0.006)	0.022*** (0.006)	0.021*** (0.006)	0.021*** (0.006)	0.021*** (0.006)	-0.019 (0.014)
Ln Review Age				-0.353 (0.343)	-0.392 (0.341)	-0.426 (0.342)	-0.428 (0.343)	-0.601* (0.344)
Ln User Contributions					-0.042*** (0.002)	-0.041*** (0.002)	-0.041*** (0.002)	-0.041*** (0.002)
Ln Photos Posted					0.007*** (0.001)	0.007*** (0.001)	0.007*** (0.001)	0.009*** (0.001)
Rest. City x Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Review Language FE	-	-	-	-	-	Yes	Yes	Yes
Reviewer Country FE	-	-	-	-	-	-	Yes	Yes
Restaurant FE	-	-	-	-	-	-	-	Yes
Observations	60,522	60,522	60,522	60,522	60,522	60,520	60,519	60,395
R^2	0.197	0.207	0.210	0.210	0.216	0.218	0.220	0.306

◀ Conclusions

◀ Next Steps