



# What's "Local" Got To Do With It? Exploring MI Brewer Survey Data

Trey Malone

 @DrTreyMalone

Assistant Professor



Department of Agricultural, Food, and Resource Economics  
Michigan State University



# Interactive Survey

1. Get out your cellphone
2. Text **TREYMALONE** to **37607**
3. Respond via text



# Google your business. What is the first thing that pops up?

Your website

One of your social  
media accounts

Your Google business  
page and address

Someone else's  
business



Article

## Craft Beer as a Means of Economic Development: An Economic Impact Analysis of the Michigan Value Chain

Steven R. Miller <sup>1</sup>, J. Robert Serrine <sup>2</sup>, Ashley McFarland <sup>3</sup>, Philip H. Howard <sup>4</sup> and  
Trey Malone <sup>1,\*</sup>

<sup>1</sup> Department of Agricultural, Food and Resource Economics, Michigan State University,  
East Lansing, MI 48824, USA; mill1707@msu.edu

<sup>2</sup> Community, Food & Environment Institute, Michigan State University Extension,  
East Lansing, MI 48824, USA; serrine@msu.edu

<sup>3</sup> Business and Industry Liaison, Minnesota Sea Grant, Duluth, MN 55812, USA; ashleymc@d.umn.edu

<sup>4</sup> Department of Community Sustainability, Michigan State University, East Lansing, MI 48824, USA;  
howardp@msu.edu

\* Correspondence: tmalone@msu.edu

Received: 26 February 2019; Accepted: 15 April 2019; Published: 2 May 2019



### For every dollar spent on a Michigan craft beer...

- 65.9 cents go to retail or food service
- 9.3 cents go to malting barley
- 8.4 cents go to distributors
- 6.8 cents go to state and federal taxes
- 6.2 cents go to hops
- 3.4 cents go to the brewer





Article

# Craft Beer as a Means of Economic Development: An Econ Value Cl

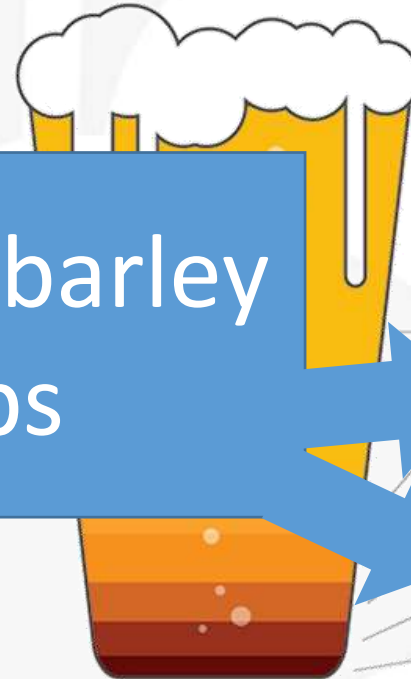
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**Big question for me:  
Might market-centric  
mechanisms promote  
growth in localized beer  
value chains?**



# Primary Objectives

- Empirically test whether Michigan hops possess a unique flavor profile relative to the PNW (e.g. *terroir*)
  1. Affective discrimination pairwise comparison and exploratory factor analysis
  2. Open-ended contingent valuation
- Quantify the premium Michigan brewers are willing to pay for Michigan-grown hops
  1. Brewer opinions
  2. Discrete choice experiment



# Objective 1: Identifying Terroir

- Brewed at Ludington Bay Brewery
  - MI Chinook (13.1 aa, 3.5 beta, .223 HSI, 1.4 total oil)
  - WA Chinook (11.4 aa, 2.7 beta, .312 HSI, 1.1 total oil)
- Conducted by Hop Growers of Michigan
- Data collected via Poll Everywhere platform at 10:30 am on March 2, 2019 (N=88)
- Participants were not informed which was one was which
- Conducted immediately after a one-hour sensory training workshop



Please indicate the smoky characteristic of Beer A.

Respond at [PollEv.com/msue](https://poll-everywhere.com/msue) or Text MSUE to 37607 once to join, then A, B, C, D, or E

Not at all	A
Slightly	B
Moderately	C
Very	D
Extremely	E





Variable	Percentage
Male	71%
<i>Education</i>	
High School Diploma or GED	4%
Some College or 2-Year Degree	28%
Four Year Bachelor's Degree	42%
Graduate or Professional School	26%
<i>Age</i>	
35 or younger	25%
36 to 50	35%
51 or older	39%
<i>Familiarity with craft beer</i>	
Very Poor	8%
Below Average	14%
Average	26%
Above Average	32%
Excellent	20%



Side note: PLEASE  
PARTICIPATE  
TOMORROW!!!!

Variable	Percentage
Male	71%
<i>Education</i>	
High School Diploma or GED	4%
Above Average	32%
Excellent	20%



# Could the attendee last year significantly taste a difference between the two beers?

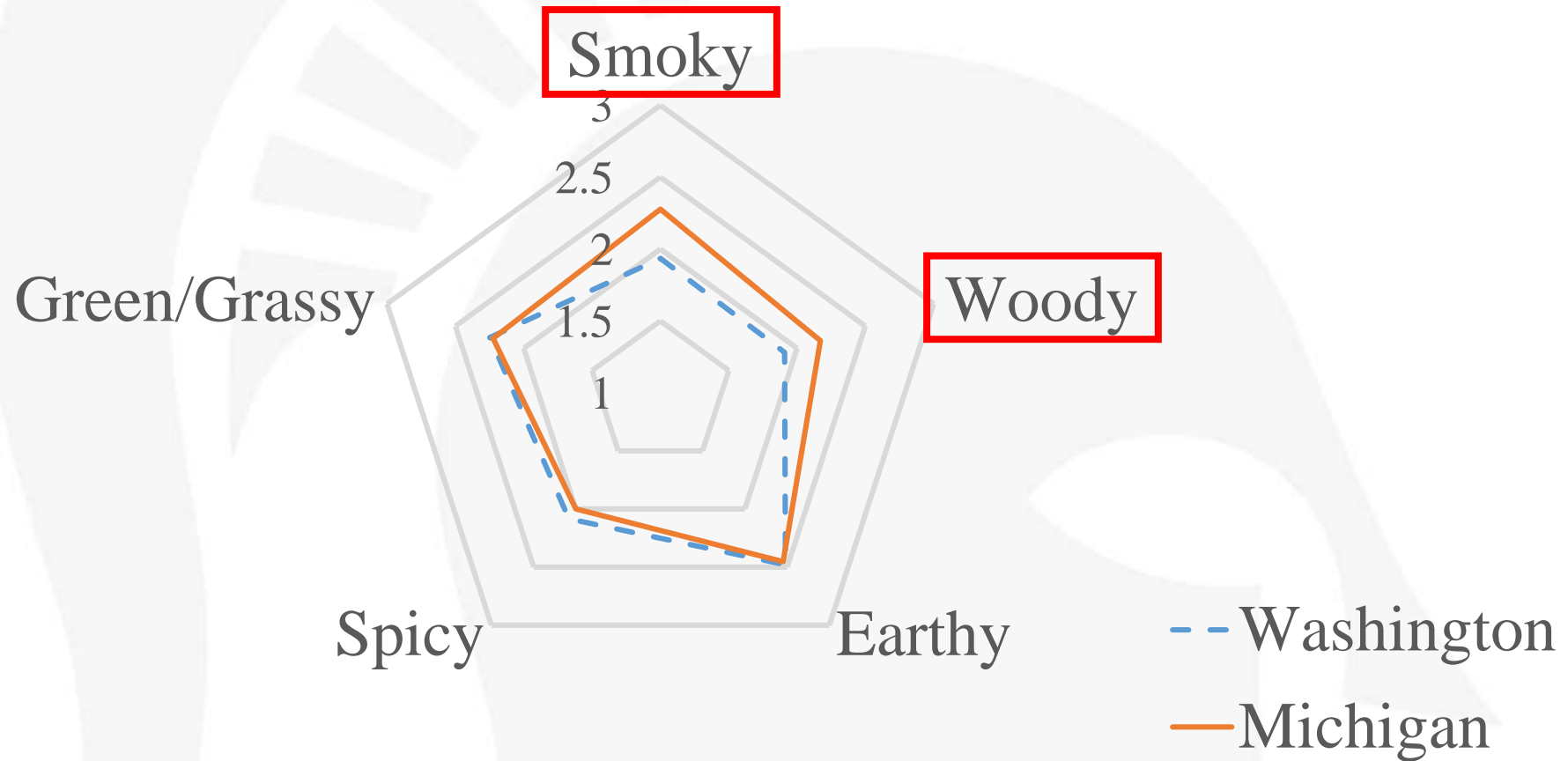
Freaking  
yes!

Maybe?

No way!



# Objective 1.1: Average Flavor Profile of MI and WA Chinook





# Exploratory Factor Analysis for MI and WA Chinook

Component	Eigenvalue	Difference	Proportion	Cumulative
Factor 1	1.44	0.27	0.29	0.29
Factor 2	1.17	0.21	0.24	0.52
Factor 3	0.96	0.22	0.19	0.71
Factor 4	0.74	0.05	0.15	0.86
Factor 5	0.69		0.14	1.00

- Conducted with correlation data to identify latent factors
- Kaiser-Meyer-Olkin Measure of Sampling Adequacy
  - Too much variation to justify combining factors




# Objective 1.2: Stated WTP for MI and WA Chinook

- Open-Ended Contingent Valuation
  - Adamowicz (2004): Roughly 100-150 CV studies published each year
- Easy to think about beer prices
  - Unlike many non-market options
- Hypothetical bias is obvious issue
  - Artificially inflates WTP
  - No clear reason why HB should effect the two beers differently (not obvious why this is a confound)

Please identify the maximum price (in \$) you would be willing to pay for a pint of Beer A.


### How to join

#### Web



- 1 Go to **PollEv.com**
- 2 Enter **MSUE**
- 3 Respond to activity

#### Text



- 1 Text **MSUE** to **37607**
- 2 Respond with **CODE**

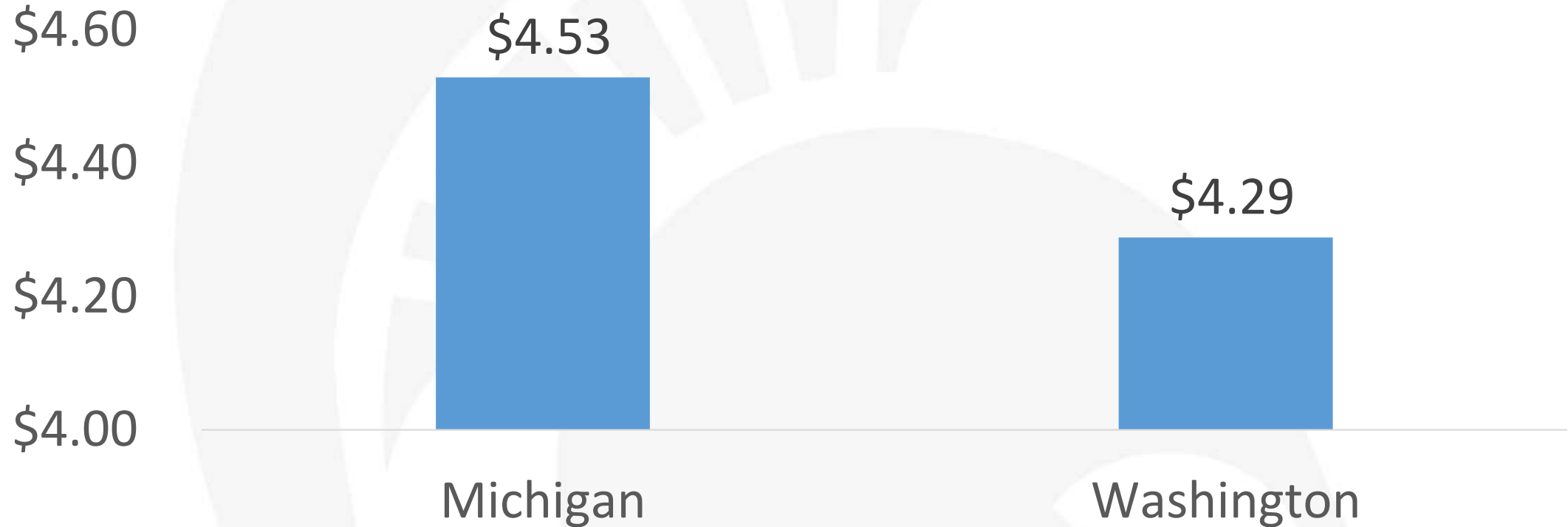


# Willingness to Pay for a Pint of Beer

	Model 1	Model 2	Model 3	Model 4
Intercept	4.29***(0.19)	3.86*** (0.48)	3.99***(0.67)	3.43***(1.01)
Michigan	0.24 (0.27)	0.17 (0.28)	-0.09 (0.92)	-0.37 (0.96)
Beer Expertise		0.12 (0.12)	0.08 (0.18)	0.05 (0.20)
Michigan x Beer Expertise			0.07 (0.25)	0.14 (0.26)
Male				-0.05 (0.36)
Education				0.32* (0.18)
Age				-0.03 (0.06)
AIC	562.6	530.8	532.7	498.4



# Mean WTP for a pint of MI and WA beers







Mean WTP for a pint of MI and WA beers

\$4.60

\$4.53

**Interpretation: No evidence  
y'all are willing to pay a  
premium for pure sensory  
differences in terroir.**



# Even if consumers are not willing to pay a premium for terroir, brewers might.

Michigan grows to No. 1 in hops production outside Pacific Northwest

Robert Allen, Detroit Free Press Published 6:00 a.m. ET Feb. 14, 2018 | Updated 4:14 p.m. ET Feb. 14, 2018

“...terroir is widely understood to make a difference with hops, and brewers frequently show a preference for hops by certain regions.”



 Luponic Distortion's Newest Features  
Michigan Hops

“In contrast to the piney, grapefruit notes Brynildson has imprinted in his head for the Pacific Northwest grown hop, he found **more Mandarin orange in the Michigan grown cones**. It is a showcase of terroir and how a difference of 2,000 miles can distinctly influence a hop.”

#1 Wall Street Journal Bestseller

DONALD MILLER

New York Times Bestselling Author

# BUILDING A STORY BRAND



Clarify Your Message  
So Customers Will Listen

Use the 7 Elements of Great Storytelling to Grow Your Business

## Every Story...

1. Starts with a character
2. Has a problem
3. Meets a guide
4. Has a plan
5. Call to action
6. Success or Failure

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THIS IS PROBABLY  
YOUR CONSUMERS'  
FIRST IMPRESSION OF  
YOUR BUSINESS!



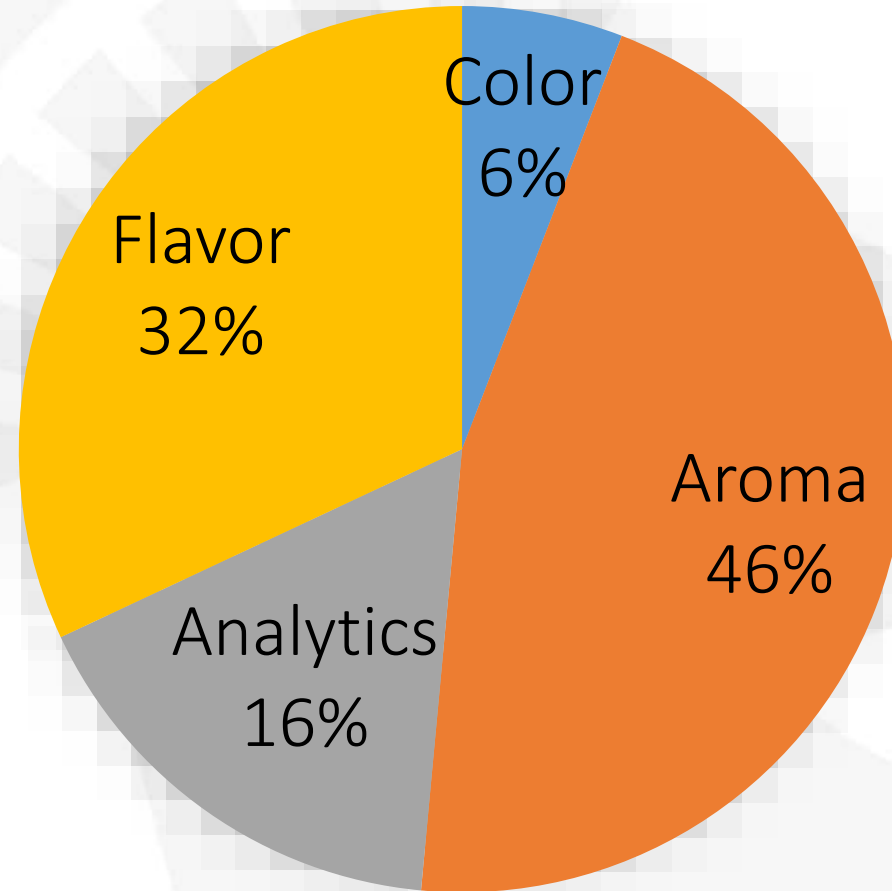
## Objective 2: MI brewers and MI cultivars

- Data collected in February 2019
- 81 brewery responses
  - 3 Indiana, 71 Michigan, 5 Ohio, 2 Virginia
  - 70 respondents were in charge of hop purchasing
- 76% of sales from respondents came from taprooms





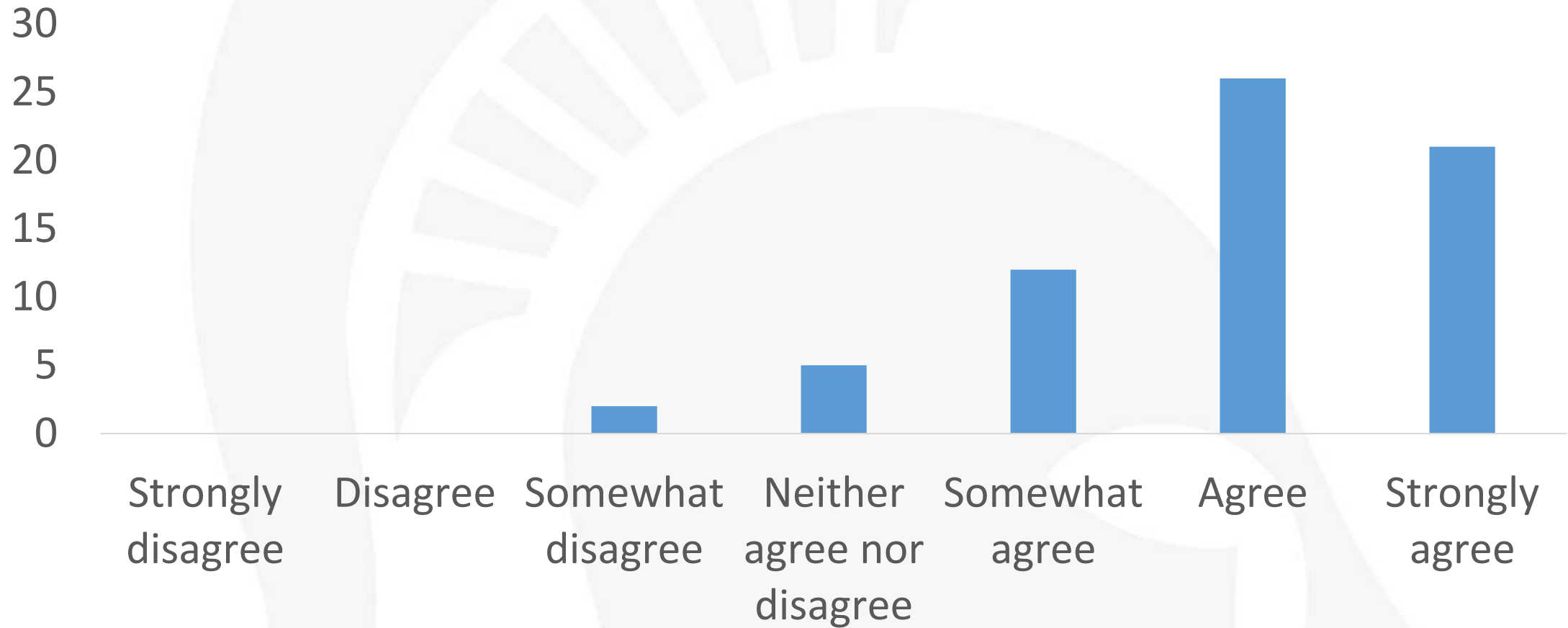
# What Michigan brewers say is most important to their hop choice



Source: Michigan Brewers Guild Survey (2019), N=82 Breweries



# Local hops taste different from hops grown in other states.

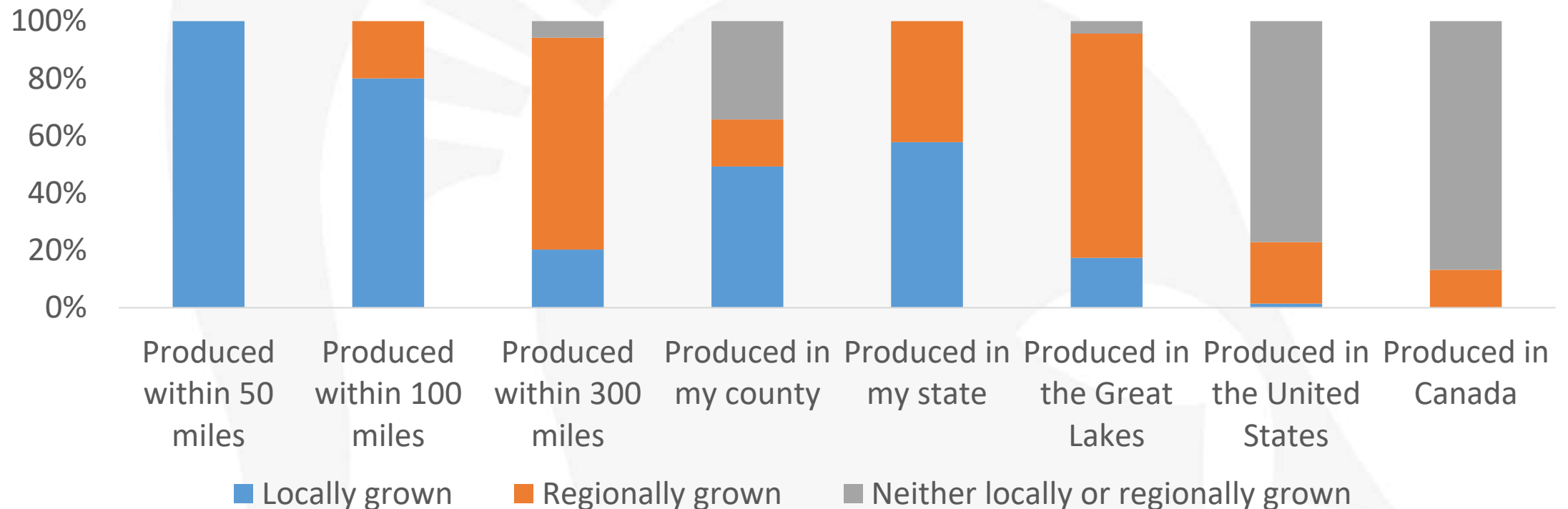






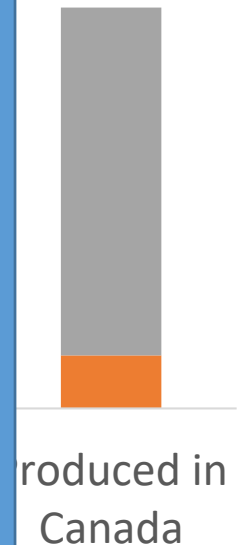
## Objective 2.1: Brewer Opinions

- What hops would you consider as locally or regionally grown?





Punchline: Brewer  
perceptions of  
“Local” are SUPER  
complicated. Why?





# Two Systems of Cognition

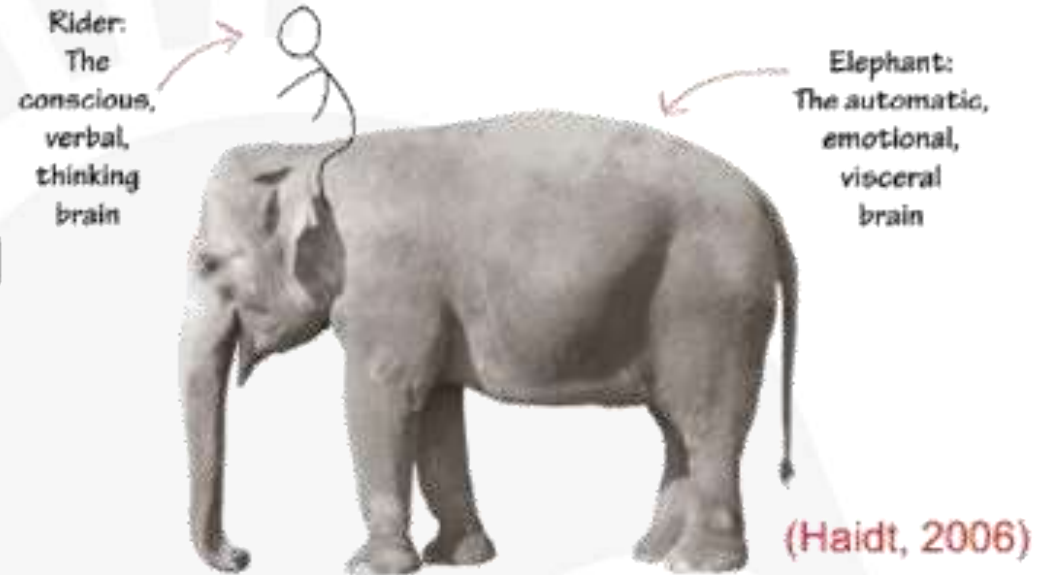
<b>System 1: The Automatic System</b>	<b>System 2: The Reflexive System</b>
Uncontrolled	Controlled
Effortless	Effortful
Associative	Deductive
Fast	Slow
Unconscious	Self-Aware
Skilled	Rule-following

Note: This is the standard “dual-process” framework. For more information, Kahneman (2011). Centuries before, Adam Smith (1759) just called them the passions (System 1) and the impartial spectator (System 2)



# One brain, two minds

- Elephant = impulsive mind
- Rider = Rational mind
- Path = the environment

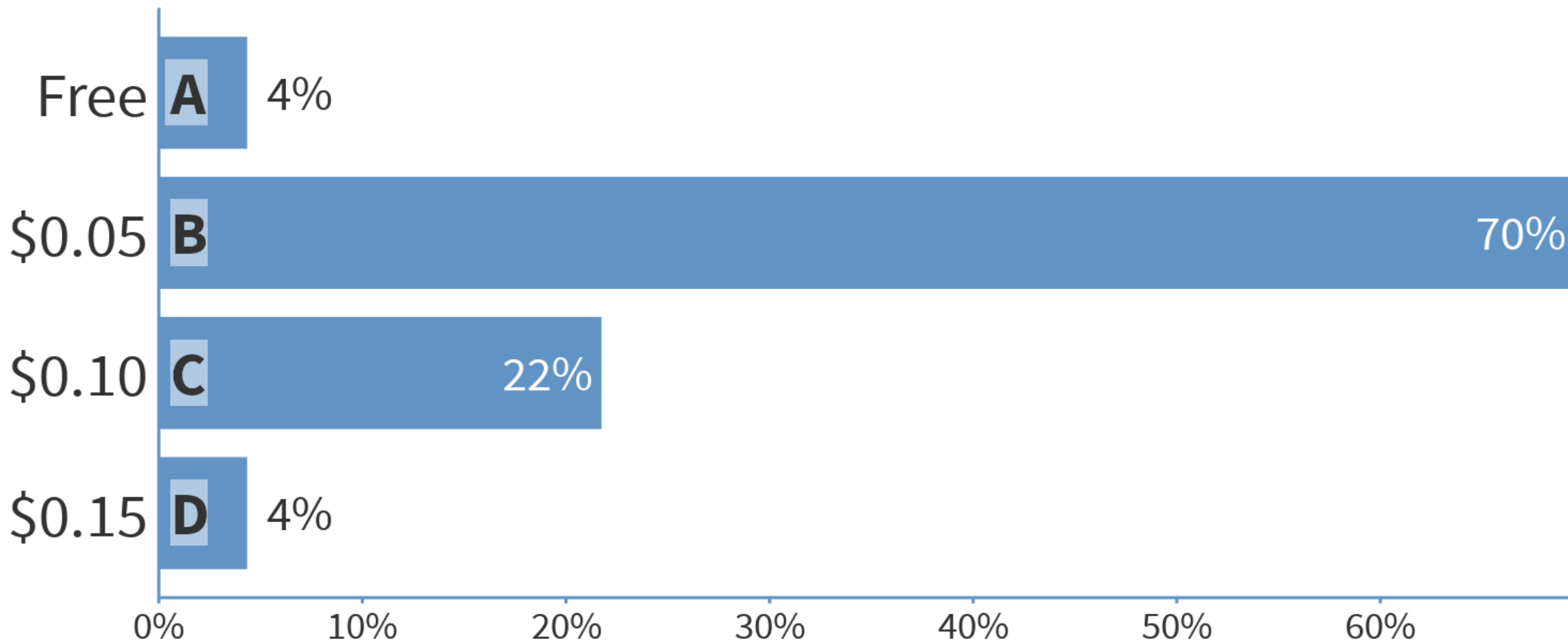


Willpower is the strength of the rider

From Kahneman (2011). Can be traced to Aristotle. Adam Smith's TMS just called them the Passions (System 1) and the Impartial Spectator (System 2).



**A bat and a ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost?**





**If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?**

1 minute

5 minutes

10 minutes

100 minutes

# Heuristics

- When people do something out of habit, little or no cognitive effort is used.
- a.k.a rules-of-thumb
  - Mental short-cuts to make decisions
  - May be adequate in many situations
    - **BUT SOMETIMES** can lead to inconsistent decisions

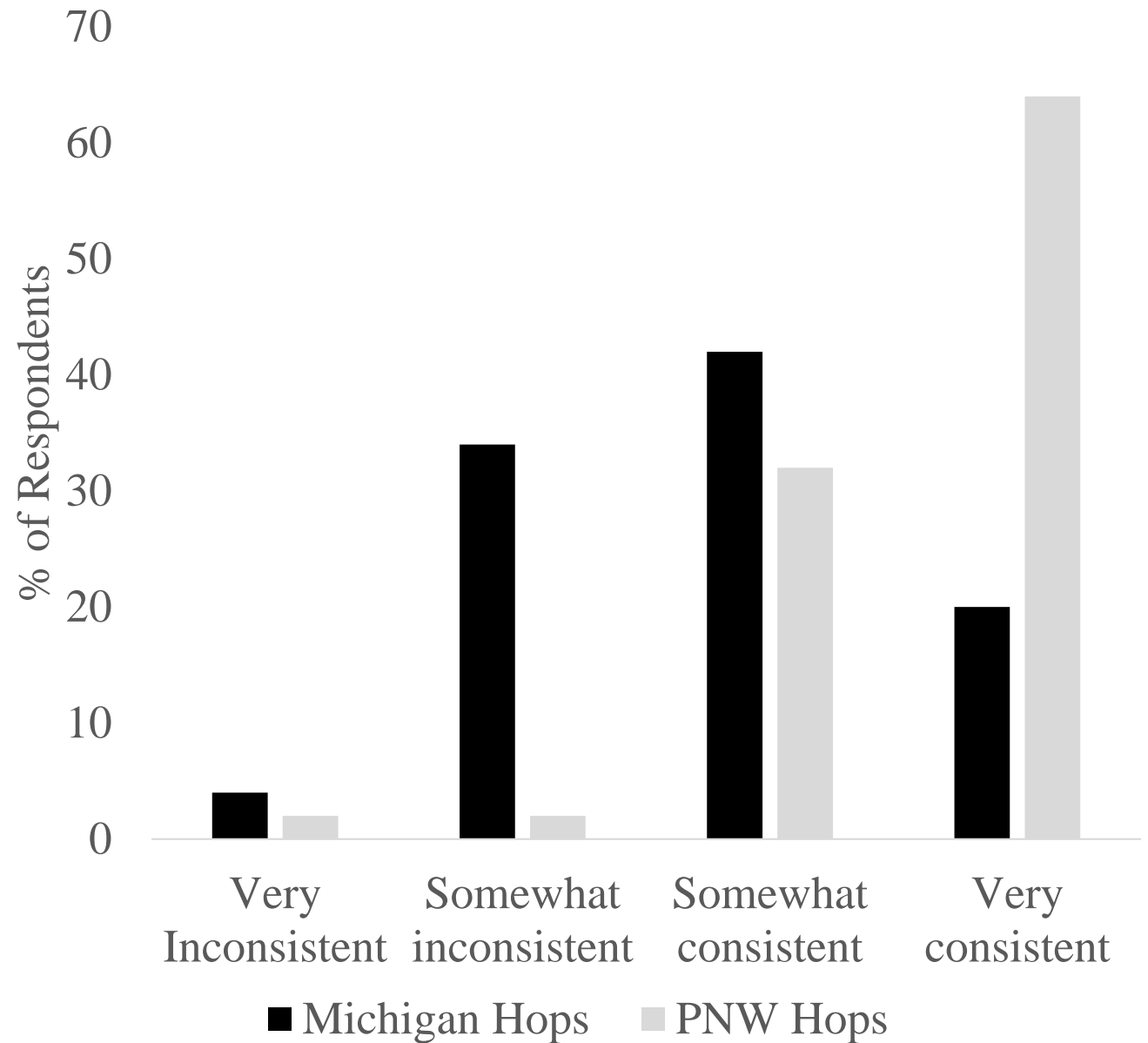




Punchline: Absent meaningful  
feedback mechanisms, we  
become trapped by emotional  
narratives

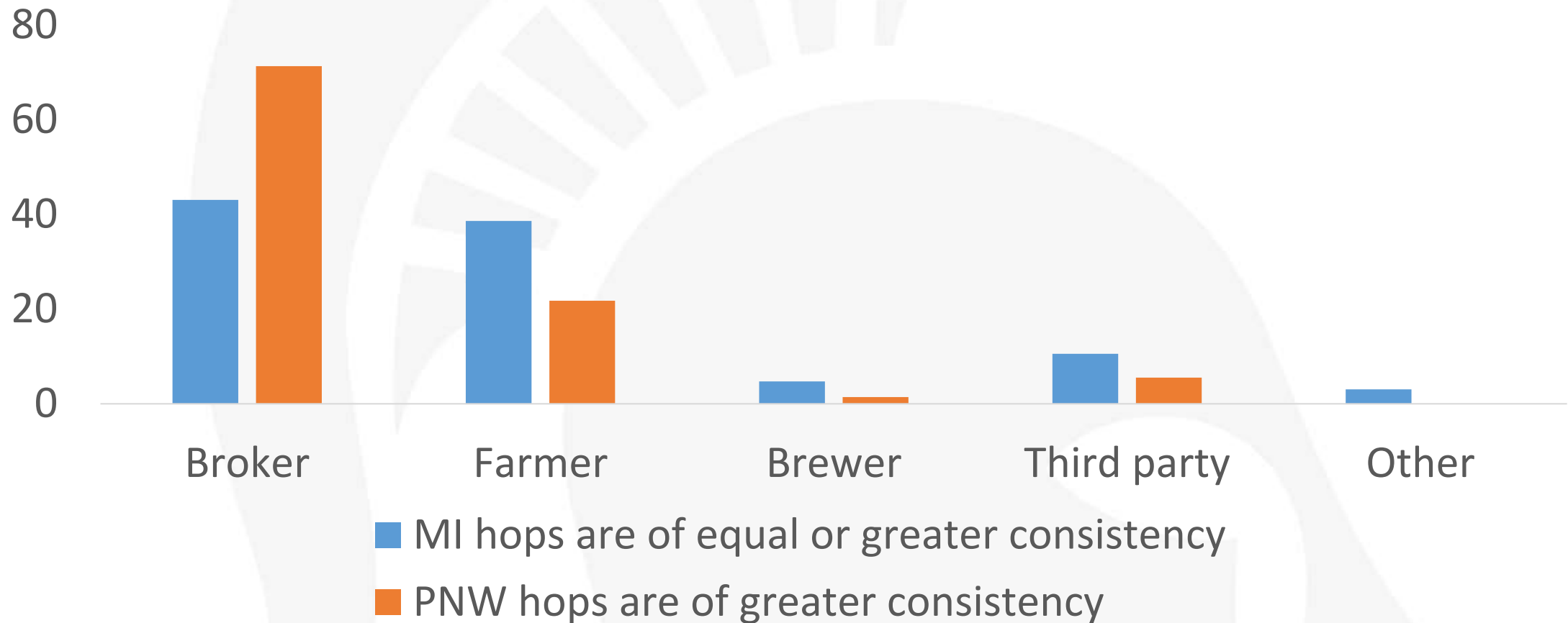


How consistent do you think hops are from the following regions?



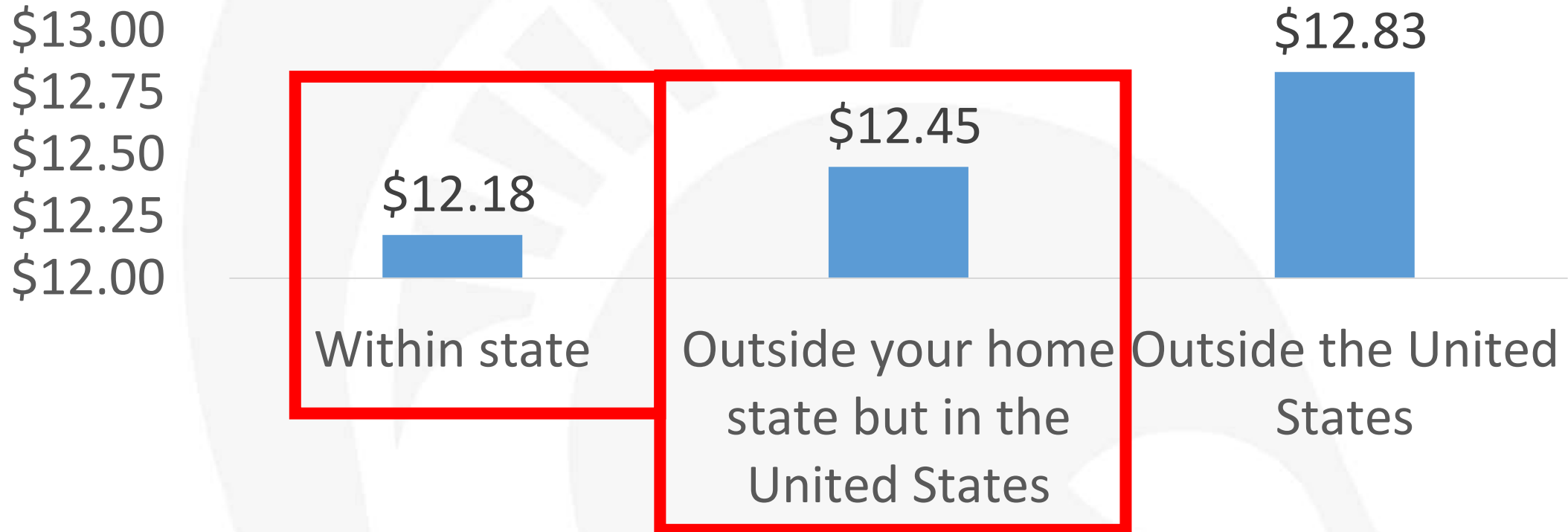


# *Where do you purchase your hops?*





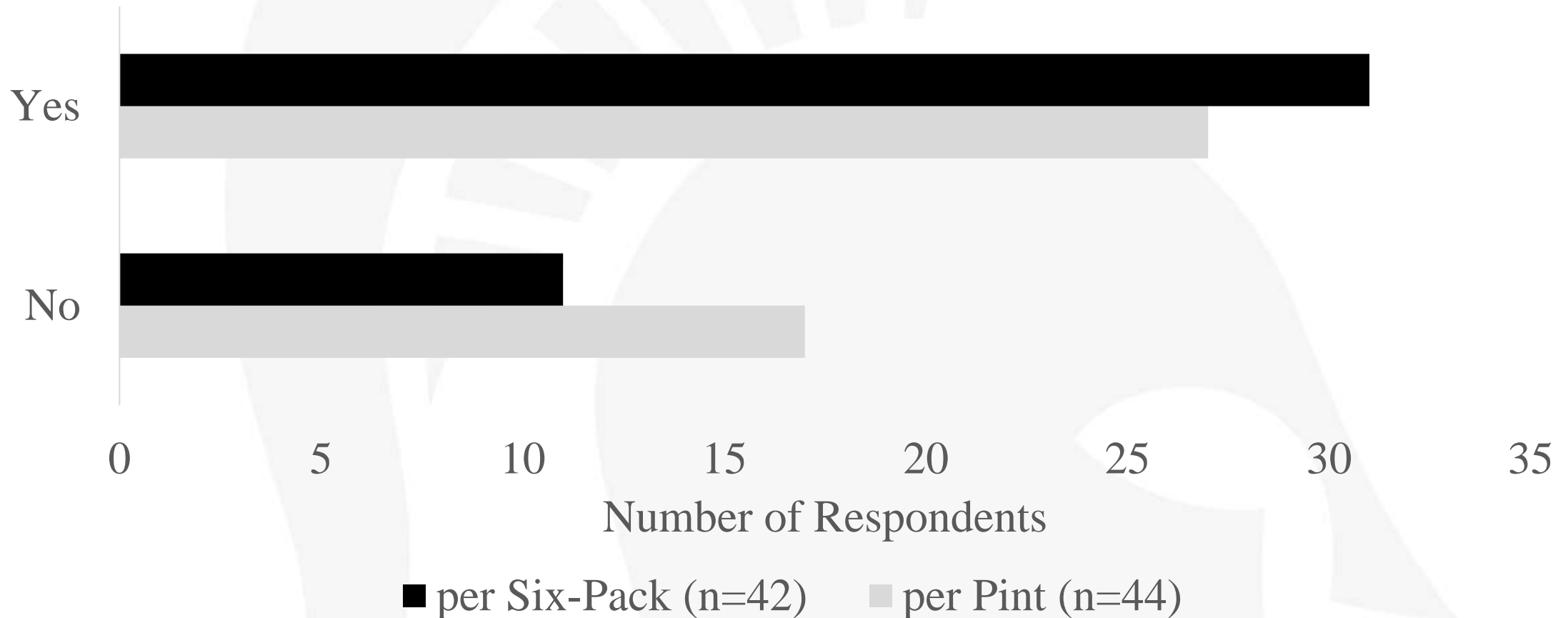
# On average, how much did you pay for a pound of hops last year? (in USD\$)



## Why might this be?



# Do you believe your consumers are willing to pay a premium for beer using locally grown hops?





Do you believe your consumers are willing to pay a

Brewers aren't all convinced  
that consumers are WTP for  
locally sourced hops.

**NEED TO FIND A WAY TO  
SHOW THEM**



Number of Respondents

■ per Six-Pack (n=42)    ■ per Pint (n=44)

35

NEW YORK TIMES BESTSELLER

Why Some Ideas Survive  
and Others Die

M A D E

to

S T I C K

Chip Heath & Dan Heath

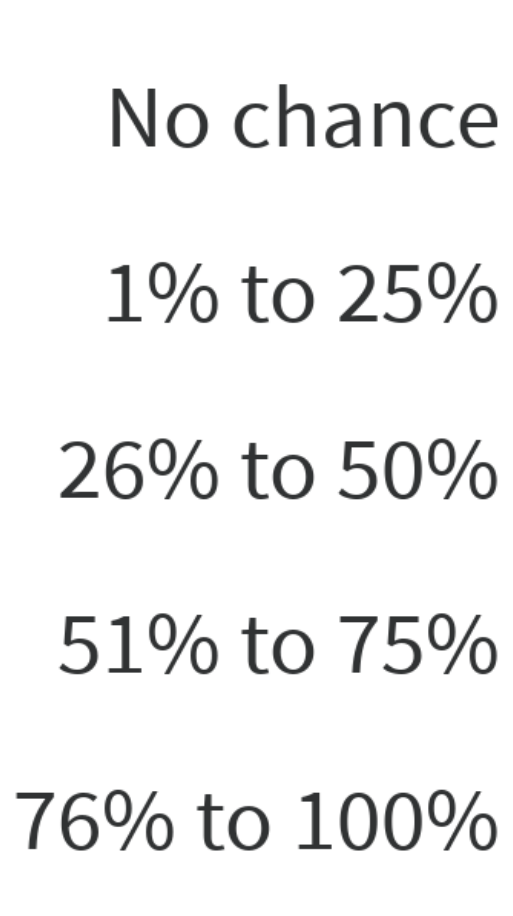
With ADDED MATERIAL (now extra sticky!)

## The Curse of Knowledge

1. Look at the person sitting next to you.
  - Between the two of you, pick a “Tapper” and a “Listener”
2. Tapper: Pick a well-known song
  - Tap out that song while the “Listener” watches you tap it out.



# To the Tappers: How likely is it that your Listener will be able to guess what song you are tapping?



NEW YORK TIMES BESTSELLER

Why Some Ideas Survive  
and Others Die

M A D E

to

S T I C K

Chip Heath & Dan Heath

With ADDED MATERIAL (now extra sticky!)

## The Curse of Knowledge

1. On average, Tappers guess 50% of the Listeners would correctly guess the song.
2. Listeners generally only guess **2.5% of the songs.**



NEW YORK TIMES BESTSELLER

Why Some  
and

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Chip Heat

# WHY DOES THIS MATTER?

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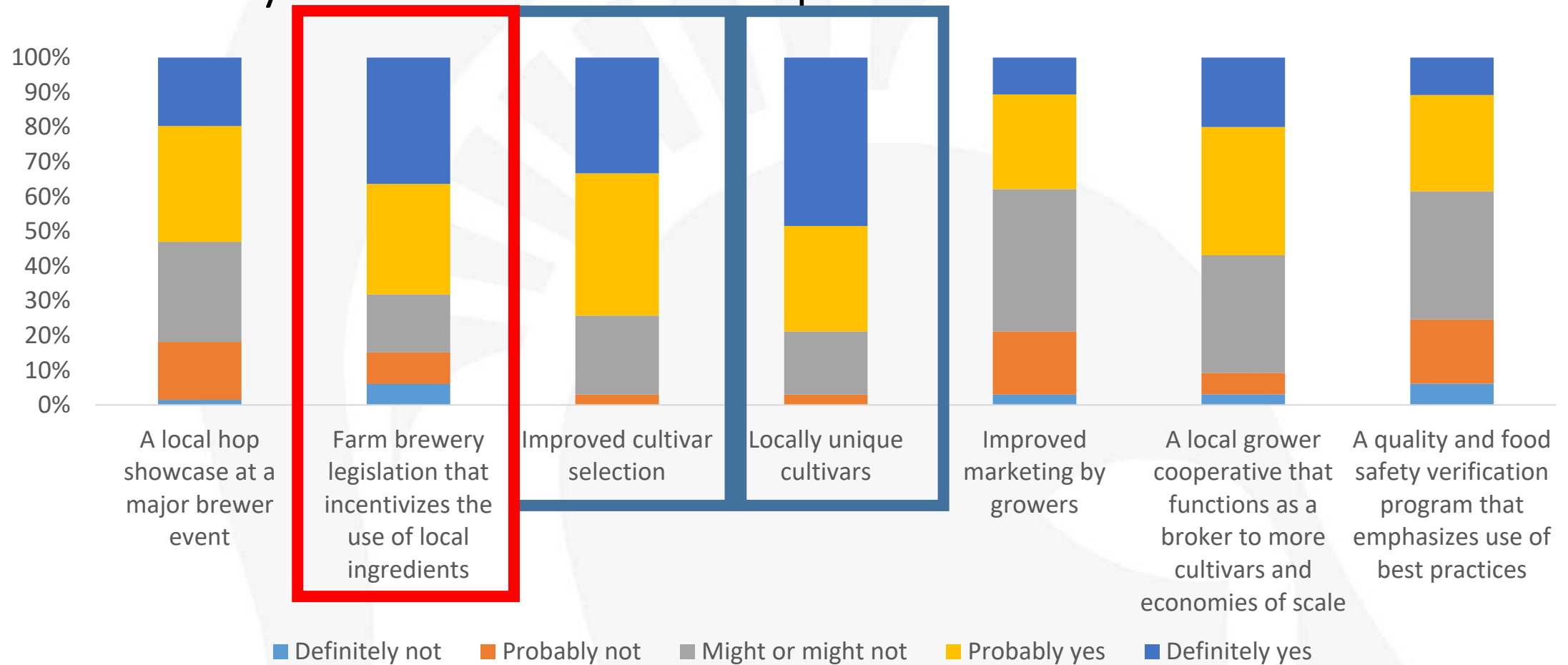
**guess 2.5% of the songs.**

With ADDED MATERIAL (now extra sticky!)

@DrTreyMalone



# Would any of the following help you decide to utilize or increase your use of local hops?





## 2.2 Brewer Stated Preferences

- Collected via a **Discrete Choice Experiment (DCE)**
- Extremely common in applied microeconomics
  - Health, environmental, transportation, agricultural, etc.
- Built off Lancasterian Random Utility Theory
  - A Product's utility is a function of its attributes (Lancaster 1966)
- Like generating a panel dataset in real-time
- McFadden's Nobel Prize awarded for work on DCE



# Discrete Choice Experiments

- Benefits of DCE
  - Consistent marginal results with revealed preference data (Lusk and Schroeder, 2004)
  - Useful when there are data limitations
  - Ability to utilize experimental design (NGENE) to draw causal implications
- Drawbacks of this DCE
  - Hypothetical
  - Visual choices might not be representative of aromatic choices

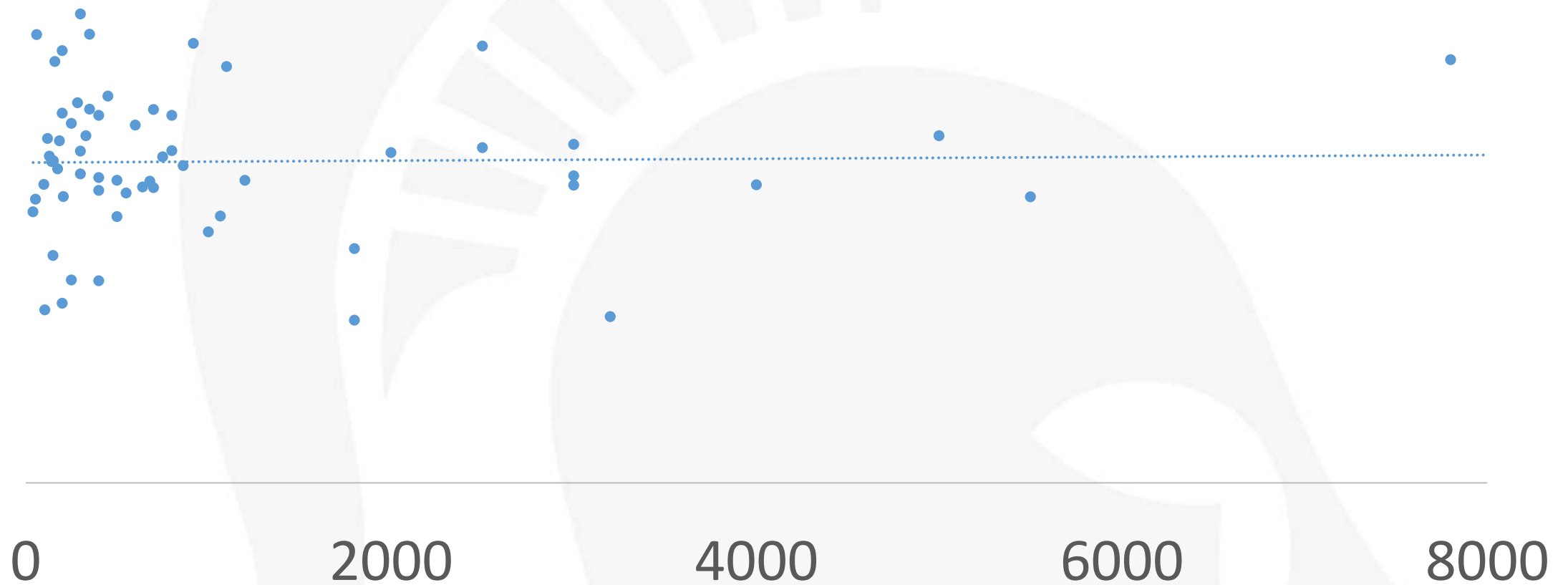
Choice Alternatives	Choice Attributes	
Grown in your home state	<i>Price</i>	<i>Global GAP</i>
Grown in the Great Lakes region	\$3.55, \$5.55, \$7.55, \$9.55	Yes, No
Grown in the Pacific Northwest		

Consider the cultivar of hops that you purchase the most. In the following questions, we will ask you to choose between an assortment of **pelletized** hops. Please imagine that all other attributes of the hops are the same. Which would you purchase for your brewery?

Grown in your home state \$7.55 per pound	Grown in the Great Lakes region \$9.55 per pound	Grown in the Pacific Northwest GLOBAL GAP Certified \$3.55 per pound	I would purchase none of these.
--	---	--	---------------------------------

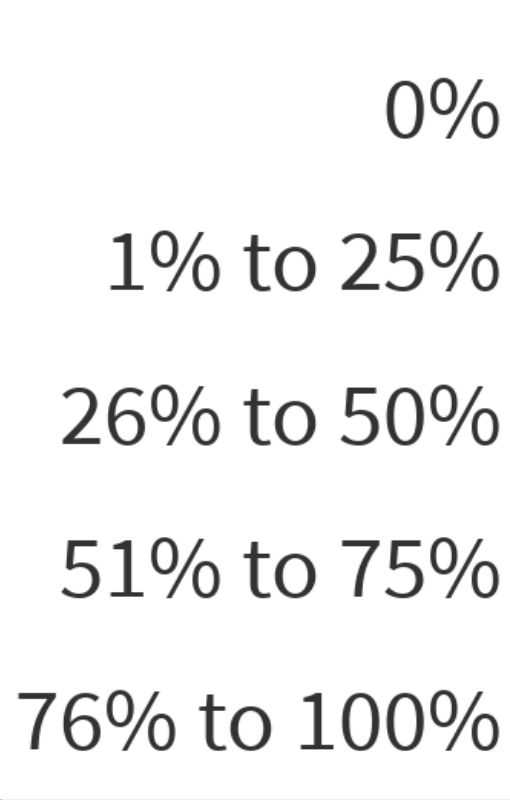


# Probability of choosing local hops and barrel capacity



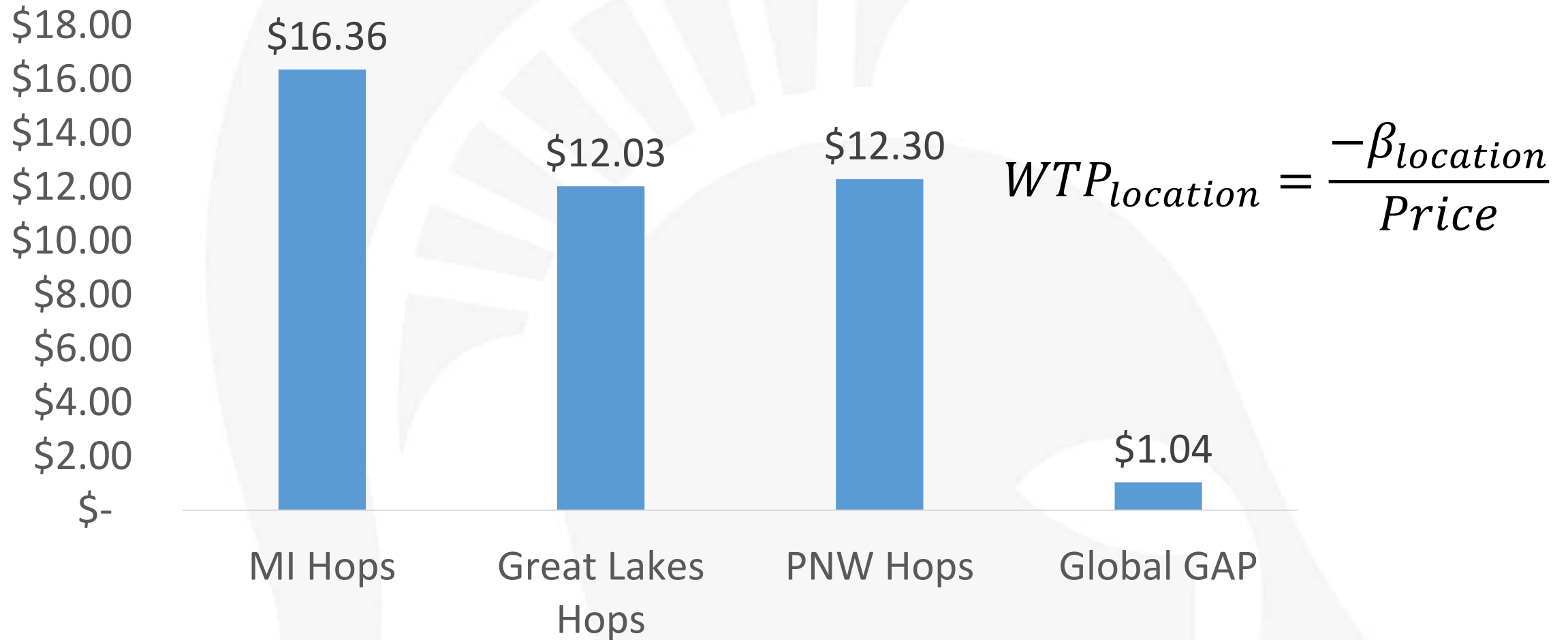


# All things held constant, how much more do you think the average brewer would be willing to pay for local hops vs. hops grown from the PNW?





# Willingness to Pay for a Pound of Hops





Willing

\$18.00  
\$16.00  
\$14.00  
\$12.00  
\$10.00  
\$8.00  
\$6.00  
\$4.00  
\$2.00  
\$-

*Ceteris Paribus,*  
Michigan brewers are  
willing to pay 33.1%  
more for Michigan  
over hops from the  
Pacific Northwest.

$$-\frac{\beta_{location}}{Price}$$





# Summary

- Limited evidence that consumers can differentiate hop terroir-related flavor profiles
- Third-party quality verification shows promise of improving brewer WTP
- Despite the limited evidence, brewers value MI hops higher than PNW hops as long as it's the same hop cultivar, consistency, and quality
- Even still, brewers overwhelmingly believe that there is regional variation in hop flavor profiles



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