



What do we know for sure? Motorcyclist riding characteristics in stated preferences data

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Upward trend?

U.S. | Mon Aug 29, 2016 4:25pm EDT

U.S. traffic deaths rose 7.2 percent in 2015: Transportation Dept.



A red traffic light stands in front of the U.S. Capitol building in Washington September 30, 2013. REUTERS/James Lawler Duggan



Last year 35,092 people died in traffic crashes in the United States, a 7.2 percent year-on-year increase that runs counter to a five-decade trend of declining fatalities, the U.S. Transportation Department said.

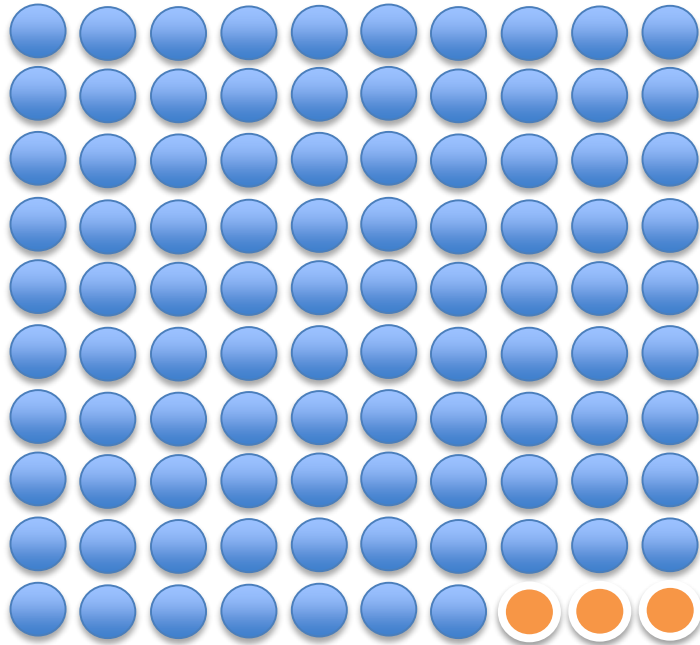
U.S. officials said lower gasoline prices combined with job growth increased the number of miles driven last year by the highest rate in nearly 25 years. Distracted driving was cited in about a tenth of traffic fatalities in 2015, the U.S. DOT said.

Data "showed traffic deaths rising across nearly every segment of the population," the department said in a statement.

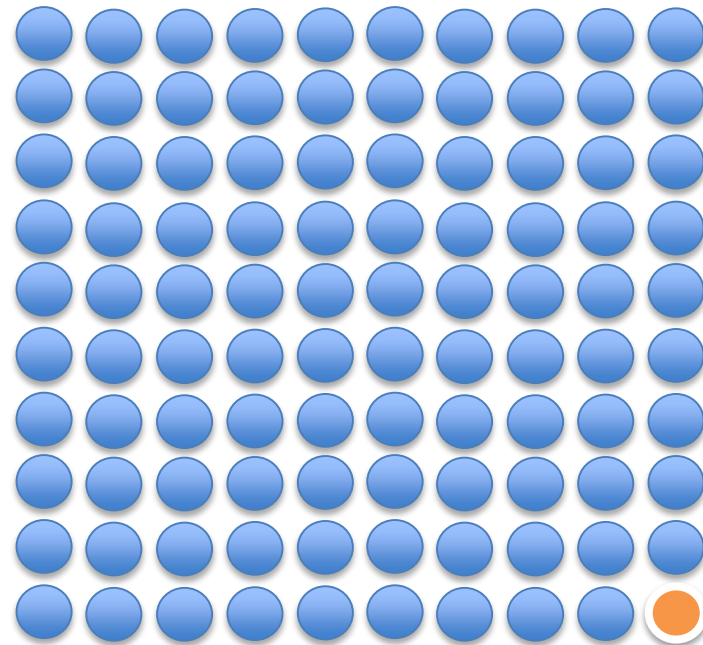


<http://www.reuters.com/article/us-usa-traffic-casualties-idUSKCN11424F>

Motorcycles are everywhere?



By Vehicle Registration



By Vehicle Miles Traveled (VMT)

Safety Ratings Sell Cars Not Motorcycles



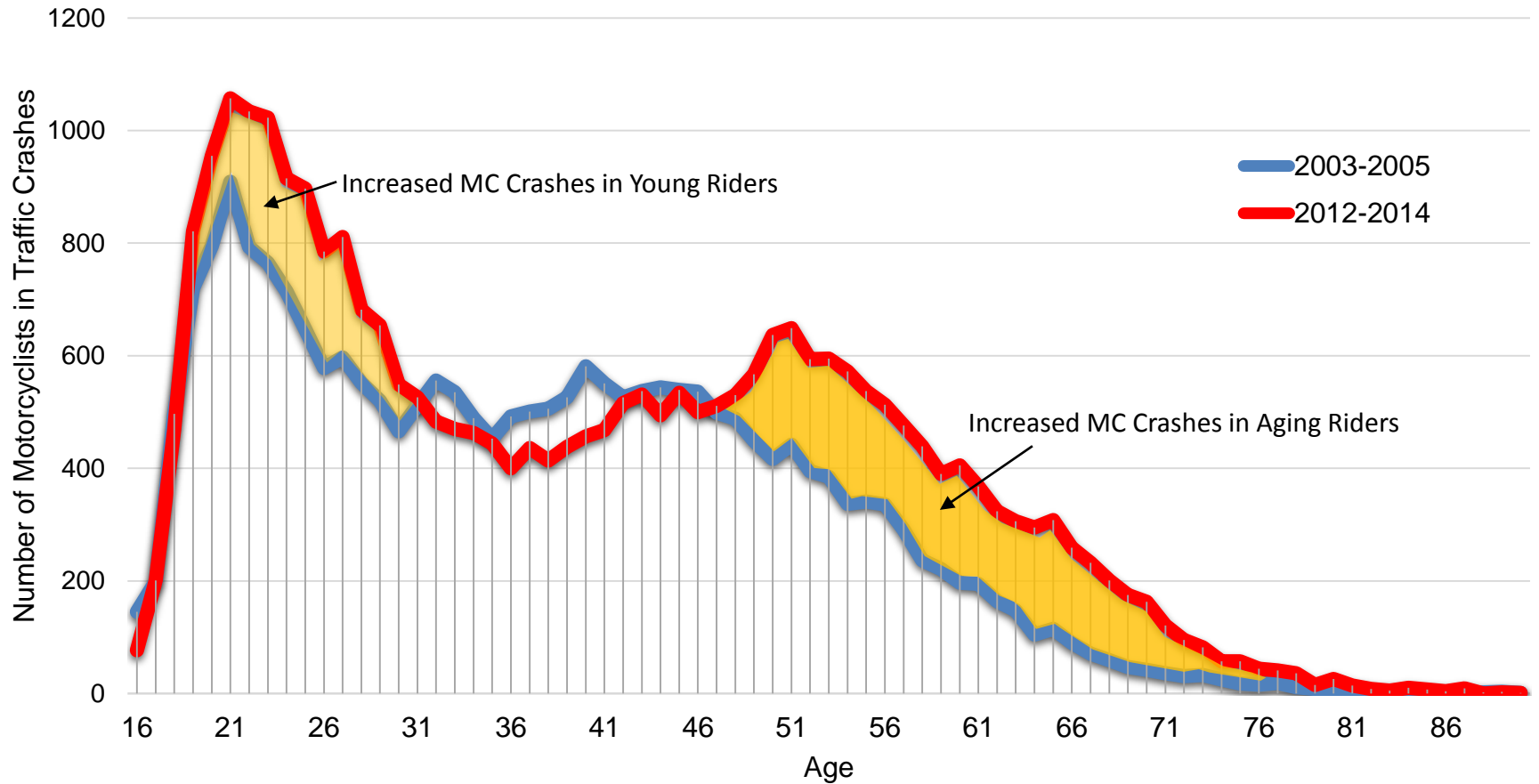
Motorcyclists' attitudes and behavior



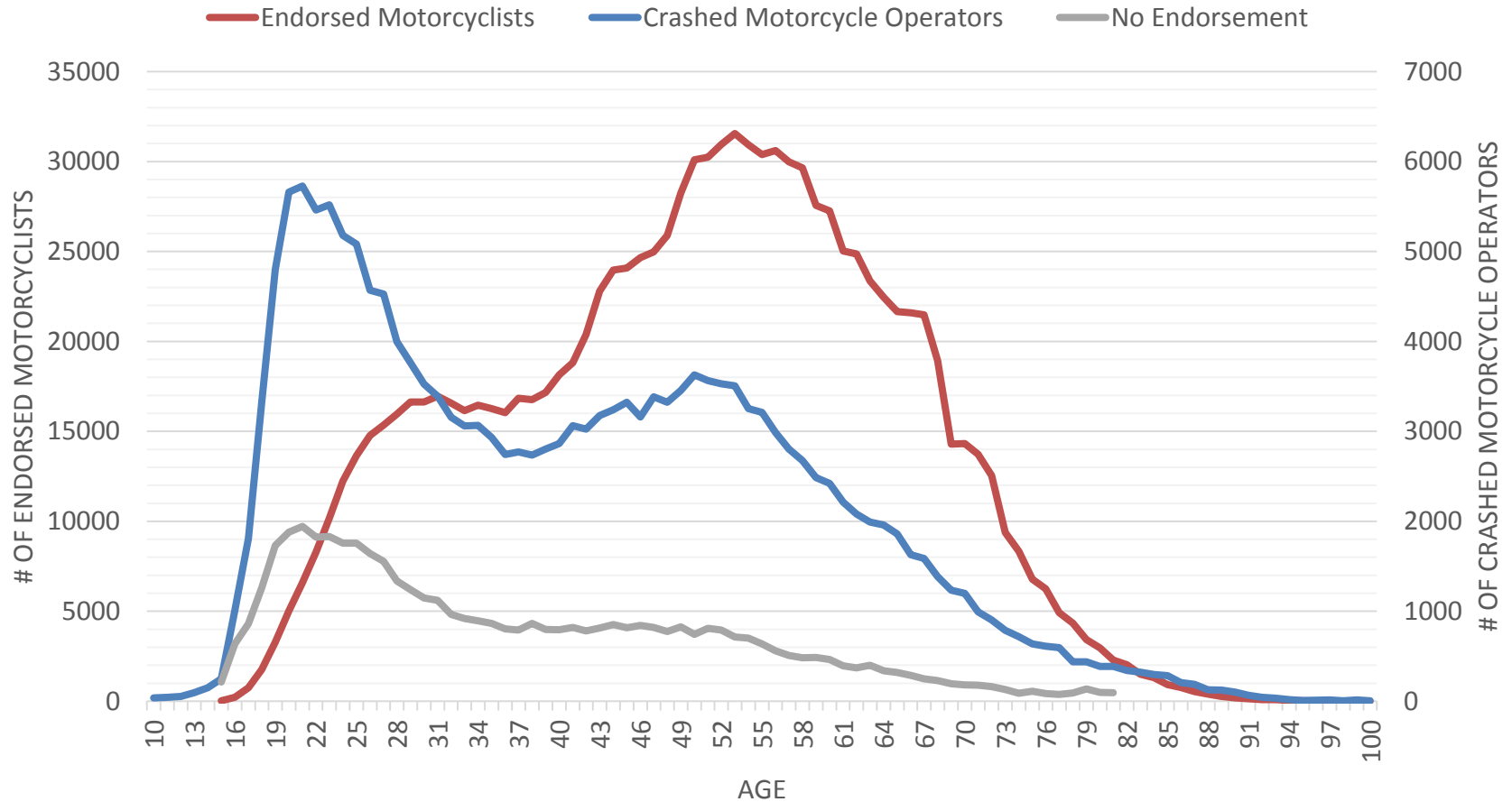
Motorcycle Crash



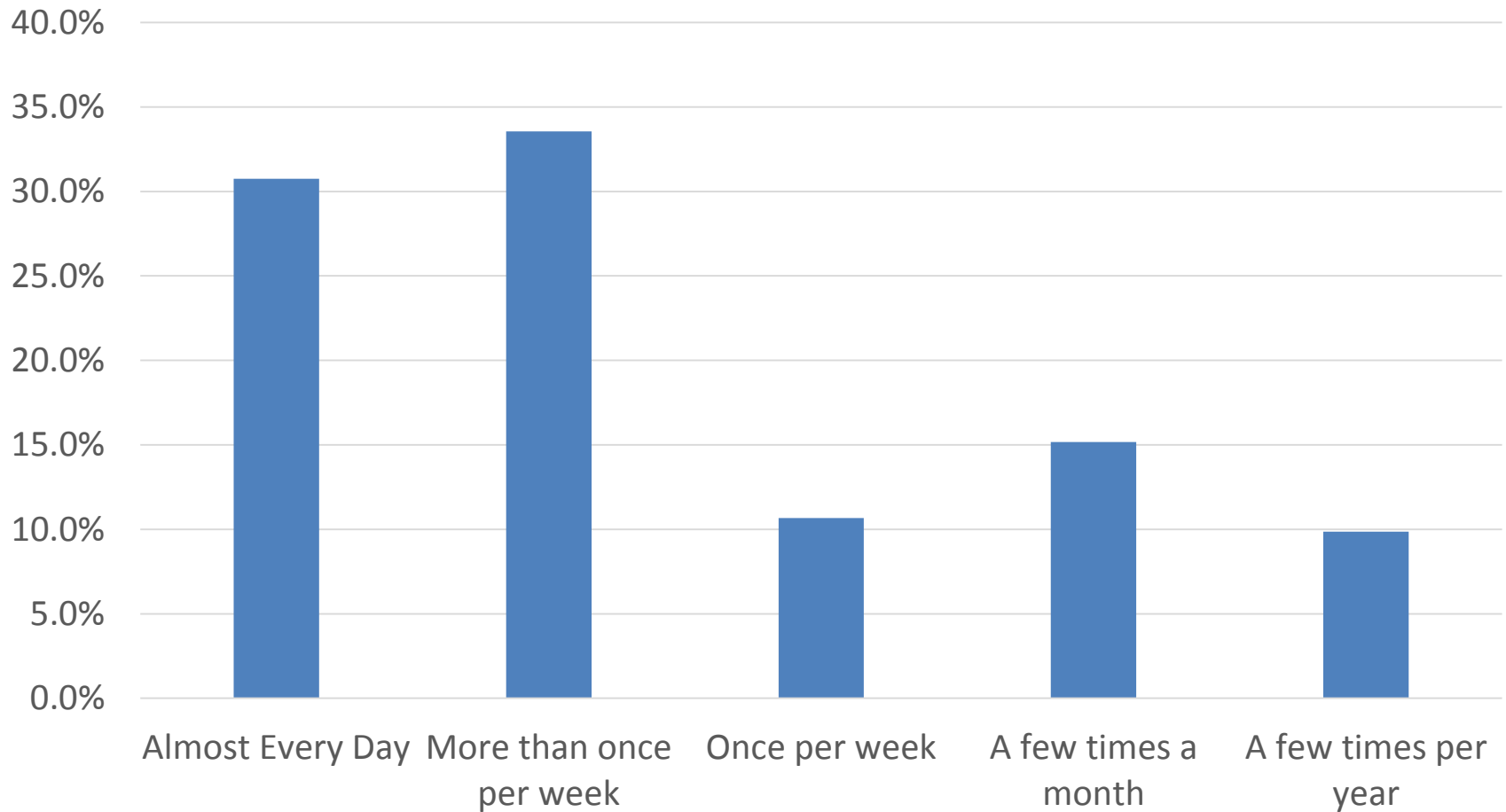
Number of motorcyclists in Florida traffic crashes by age for a three year period (Florida)



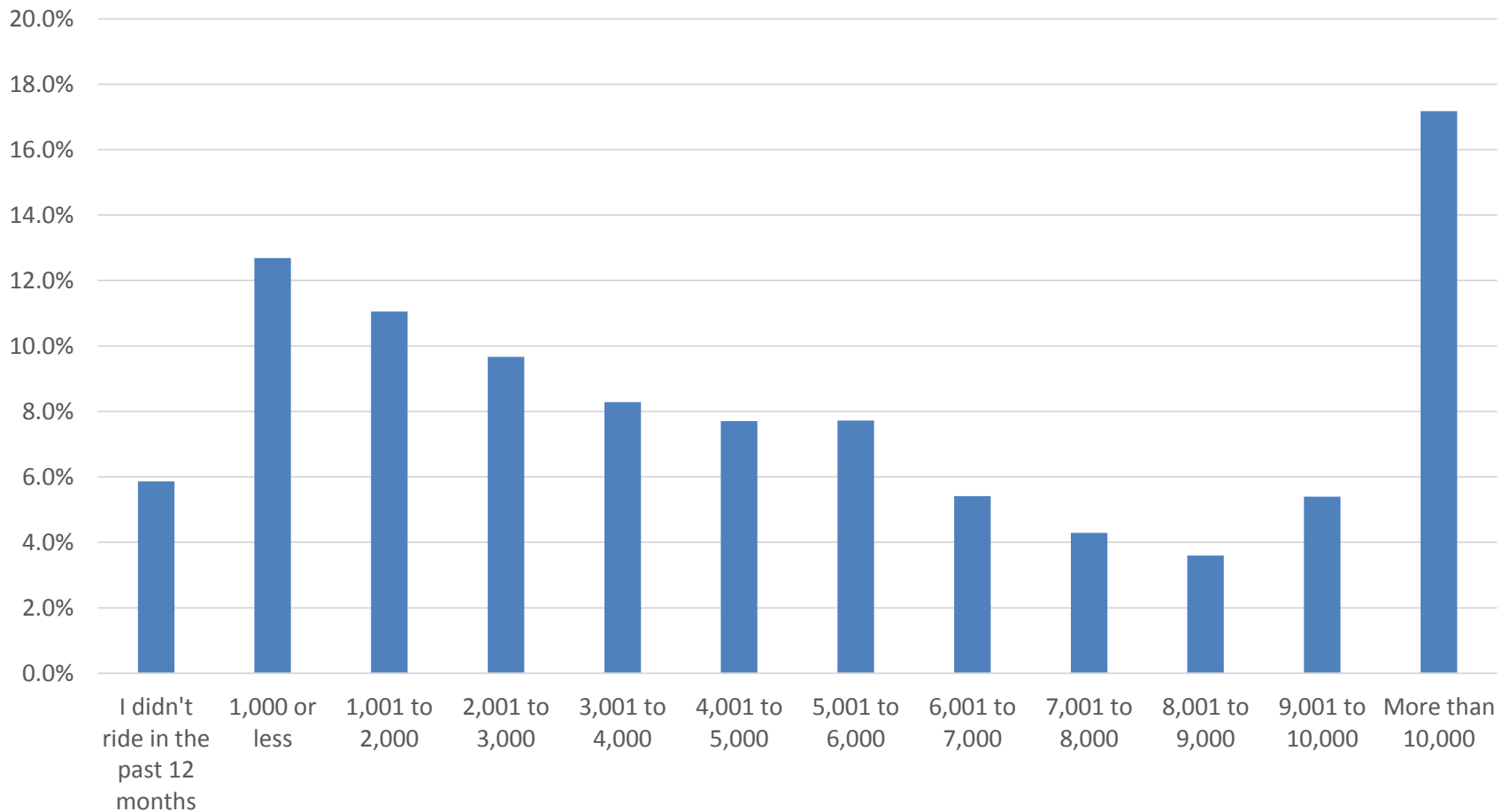
Endorsements and Motorcycle Crashes in Florida (2005-2014)



How often have you ridden your motorcycle (in the past 12 months)? (n=3064)



How many miles have you operated a motorcycle in the past 12 months? (n=3118)



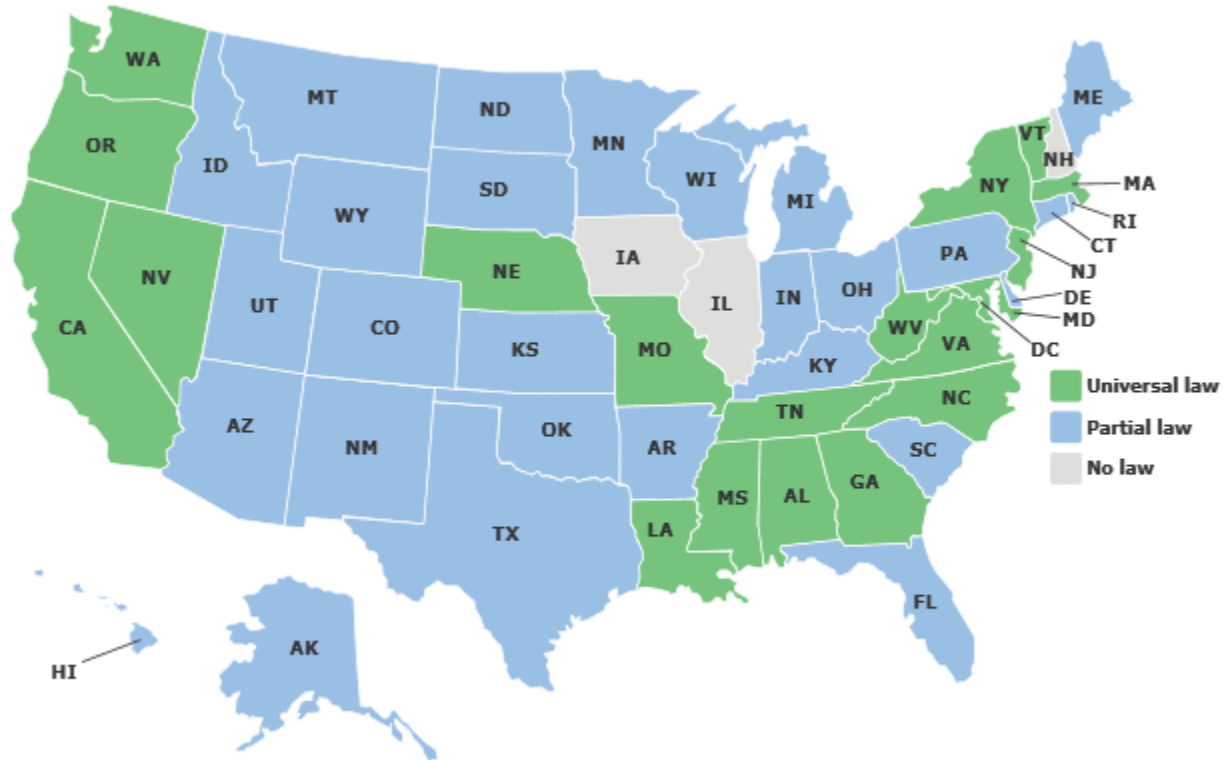
How often vs. How many miles

		How often have you ridden your motorcycle (in the past 12 months)?					Total
		Almost Every Day	More than once per week	Once per week	A few times a month	A few times per year	
How many miles have you operated a motorcycle in the past 12 months?	I didn't ride in the past 12 months						110
	1,000 or less	13	53	46	122	159	393
	1,001 to 2,000	38	109	62	113	26	348
	2,001 to 3,000	65	106	54	70	9	304
	3,001 to 4,000	52	113	43	47	6	261
	4,001 to 5,000	67	96	38	38	4	243
	5,001 to 6,000	61	129	26	26	1	243
	6,001 to 7,000	63	78	19	10	0	170
	7,001 to 8,000	55	68	6	6	1	136
	8,001 to 9,000	44	57	8	5	0	114
	9,001 to 10,000	95	58	11	5	0	169
	More than 10,000	375	149	9	7	0	540
Total		928	1016	322	449	206	3031

Increasing the Voluntary Use of Helmets



Motorcycle Helmet Law



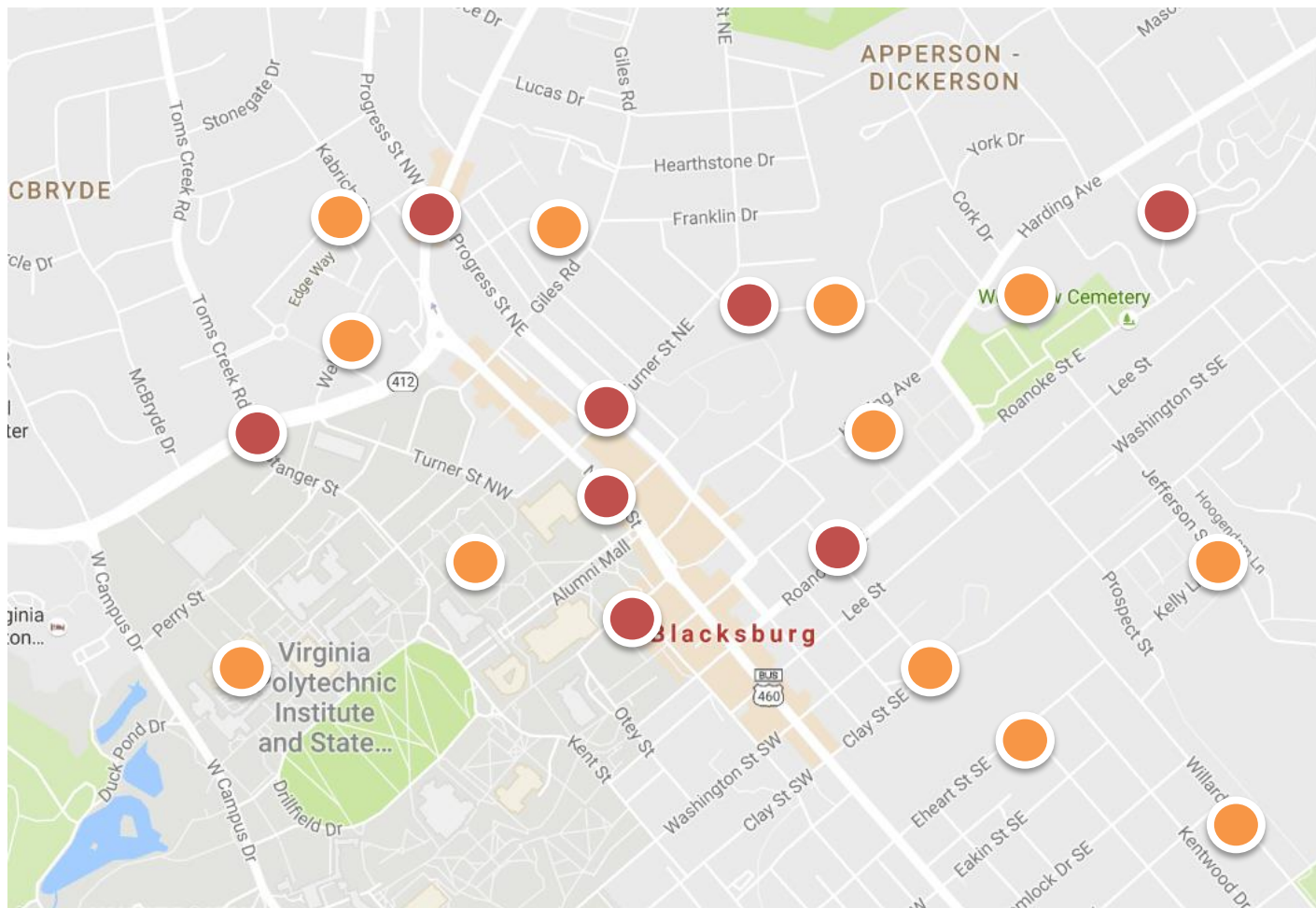
<http://www.iihs.org/iihs/topics/laws/helmetuse/mapmotorcyclehelmets>



How to Measure the Use of Helmet

- Three common data collection methods for motorcycle helmet use
 - Stated-Preference (SP) surveys
 - Motorcycle crash data analysis
 - Observational surveys: Revealed Preference (RP)

Lee, C., Pino, J., and Schultz, D. (2015) Measuring the Use of Motorcycle Helmet. Transportation Research Record: Journal of the Transportation Research Board, No. 2520, Transportation Research Board, Washington, D.C., pp. 157–164. DOI: 10.3141/2520-18

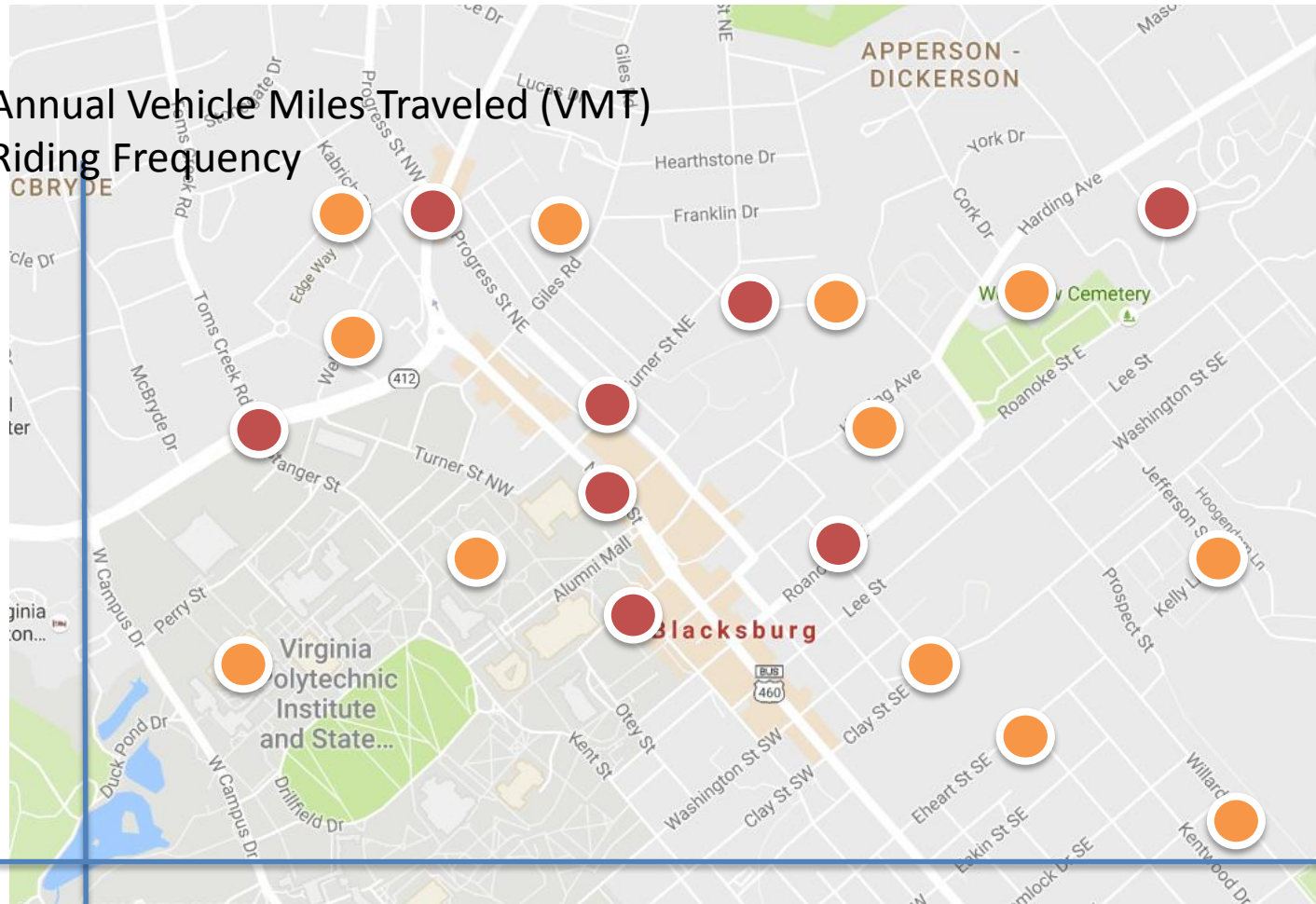
[Example] 20 observed Motorcyclists – 60% helmeted



-  Helmeted
-  Not Helmeted

Add Other Information (VMT, socio-demographic factors, etc)

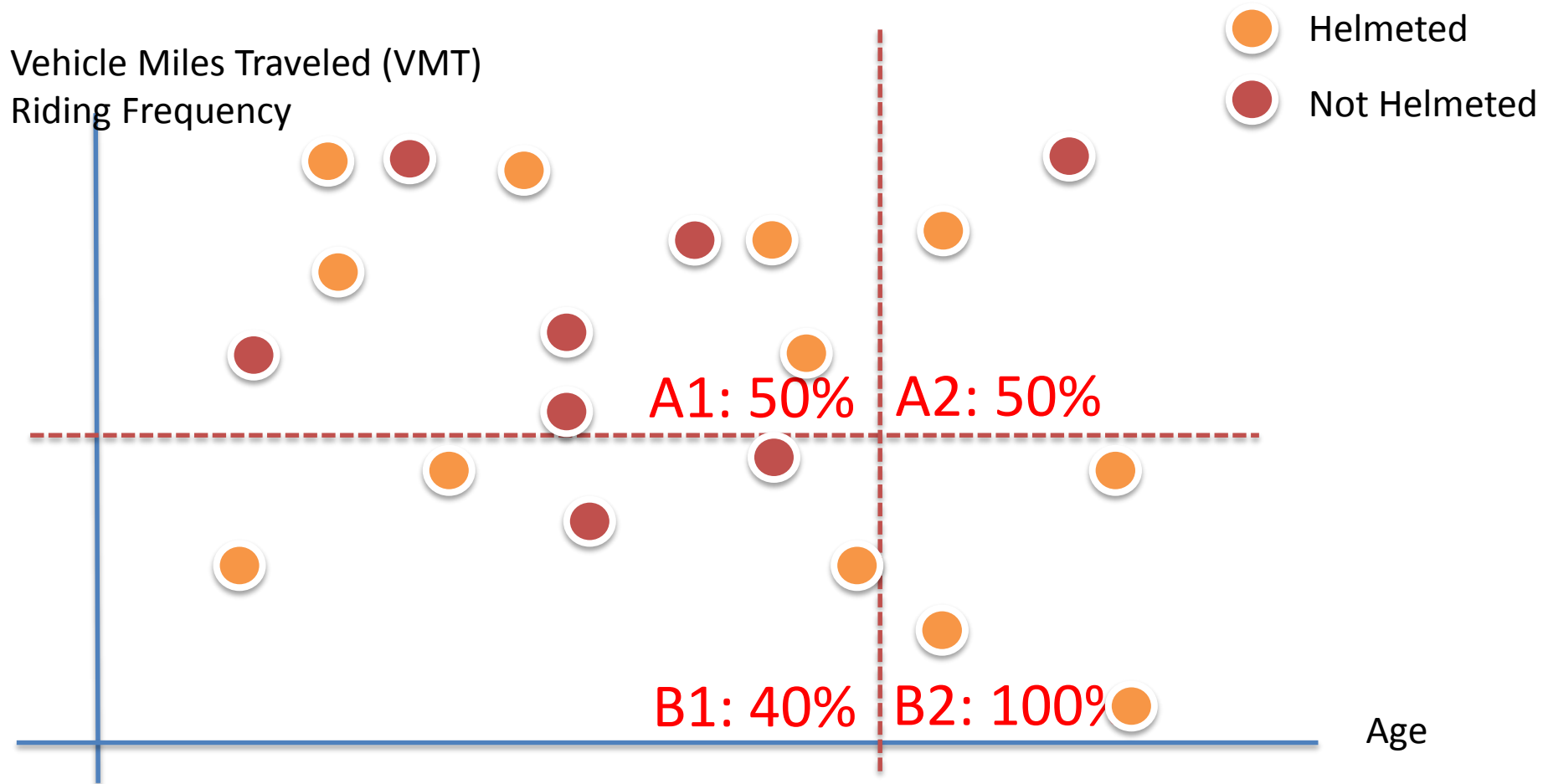
Annual Vehicle Miles Traveled (VMT)
Riding Frequency



- Helmeted
- Not Helmeted

Age

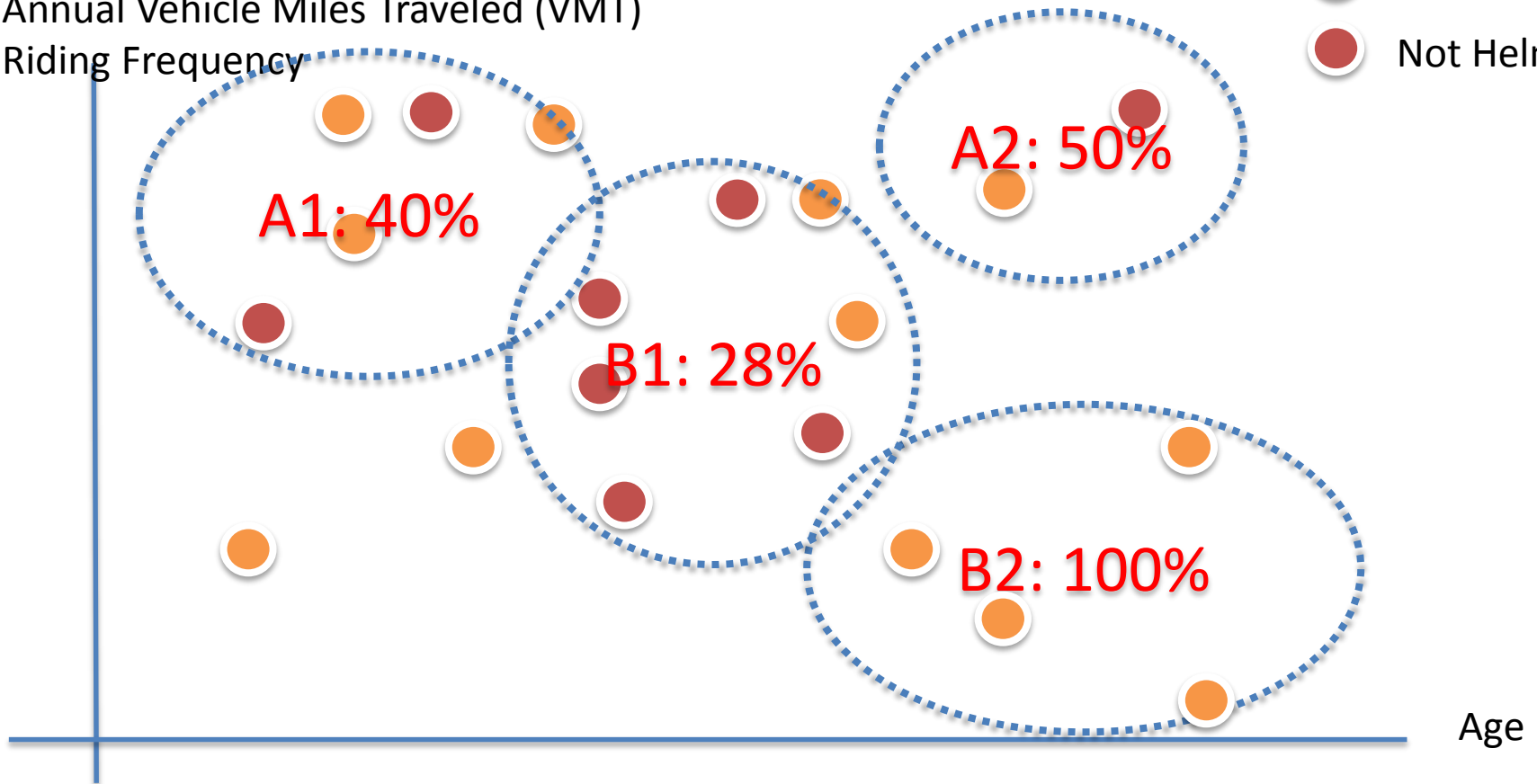
Classification Analysis (Example)



Cluster Analysis (Example)

Annual Vehicle Miles Traveled (VMT)
Riding Frequency

- Helmeted
- Not Helmeted



		How often have you ridden your motorcycle (in the past 12 months)?					Total
		Almost Every Day	More than once per week	Once per week	A few times a month	A few times per year	
Which of the following best describes your use of a motorcycle helmet in Florida?	I always wear a helmet when riding a motorcycle	530	634	227	325	214	1930
		56.4%	61.6%	69.6%	70.0%	71.6%	63.1%
	I wear a helmet most of the time	171	170	46	59	46	492
		18.2%	16.5%	14.1%	12.7%	15.4%	16.1%
	I wear a helmet on limited occasions (long distance trips, winter season, etc.)	144	129	31	52	20	376
		15.3%	12.5%	9.5%	11.2%	6.7%	12.3%
	I seldom or never wear a helmet	94	96	22	28	19	259
		10.0%	9.3%	6.7%	6.0%	6.4%	8.5%
Total		939	1029	326	464	299	3057
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

A hierarchical cluster analysis that used Ward's method with squared Euclidean distance

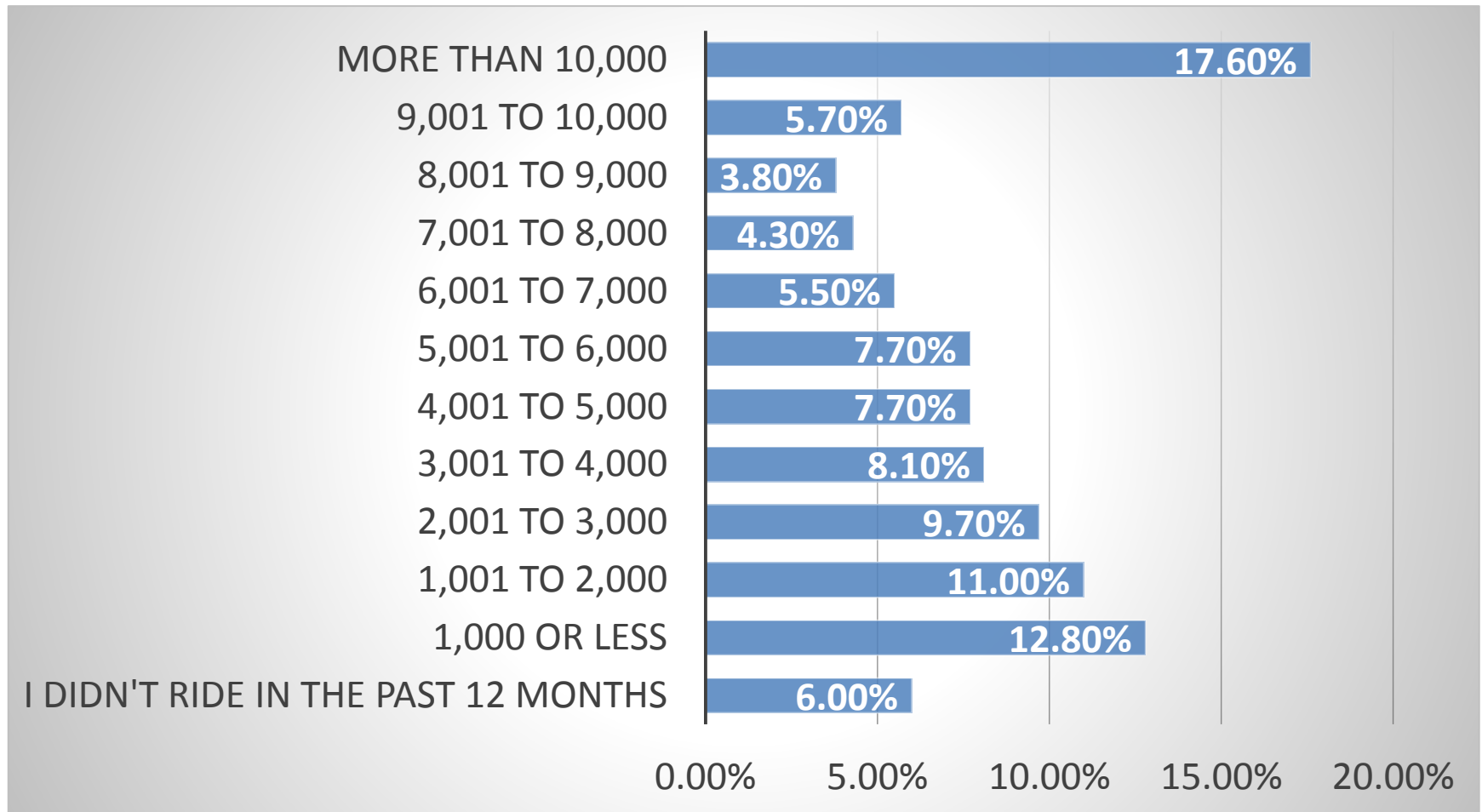
	A	B	C	D	E	Total
I always wear a helmet when riding a motorcycle	24 7.2%	362 63.7%	287 49.3%	464 89.7%	576 88.5%	1713 64.6%
I wear a helmet most of the time	48 14.4%	128 22.5%	150 25.8%	45 8.7%	53 8.1%	424 16.0%
I wear a helmet on limited occasions (long distance trips, winter season, etc.)	117 35.0%	61 10.7%	101 17.4%	7 1.4%	20 3.1%	306 11.5%
I seldom or never wear a helmet	145 43.4%	17 3.0%	44 7.6%	1 .2%	2 .3%	209 7.9%
	334	568	582	517	651	2652
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

		Clusters_5					Total
		A	B	C	D	E	
In your opinion, how important is it for a motorcyclist to wear a helmet?	Very important	11	364	241	451	592	1659
		3.4%	64.5%	41.8%	87.2%	90.8%	62.9%
	Fairly important	18	93	119	32	37	299
		5.5%	16.5%	20.6%	6.2%	5.7%	11.3%
	Important	62	80	143	32	21	338
		19.0%	14.2%	24.8%	6.2%	3.2%	12.8%
	Slightly important	114	20	54	2	2	192
		35.0%	3.5%	9.4%	.4%	.3%	7.3%
	Not important at all	121	7	20	0	0	148
		37.1%	1.2%	3.5%	0.0%	0.0%	5.6%
Total		326	564	577	517	652	2636
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Stated Preferences Data

- Response Bias
 - What time do you wake up?
 - 7:51 am, 8:13 am, 7:55 am >> 8 am
- Which of the following best describes your motorcycle helmet use?
 - Always (100% or 99%)
 - Almost (85% or 65%)
 - Sometimes (12% or ...)

How many miles have you operated a motorcycle in the past 12 months?



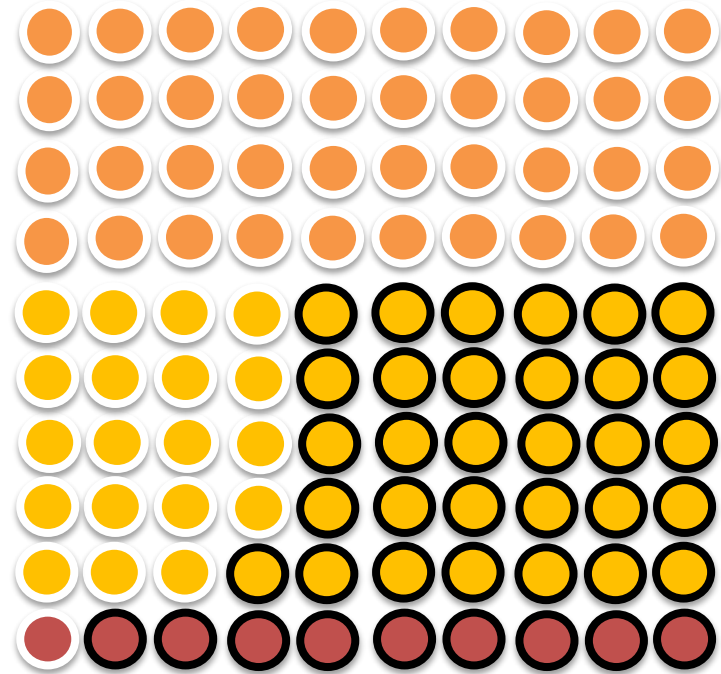
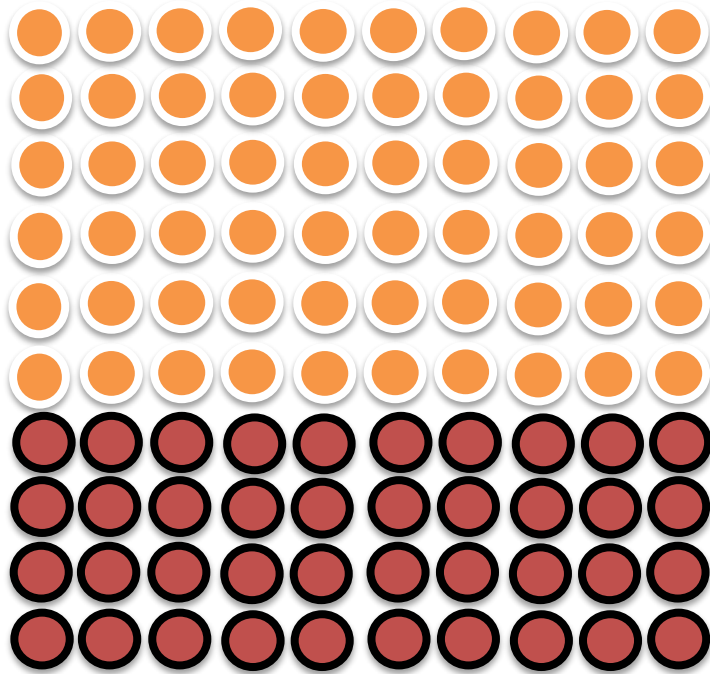
VMT vs. Helmet Use

	A	B	C	D	E	Total
Annual VMT in the past 12 months-Ratio	1.4	1	1.3	1.2	1.1	
I always wear a helmet when riding a motorcycle (90%)	7.2%	63.7%	49.3%	89.7%	88.5%	64.6%
I seldom or never wear a helmet	43.4%	3.0%	7.6%	.2%	.3%	7.9%
Selective Users Proportion (60%)	49.4%	33.3%	43.1%	10.1%	11.2%	27.5%

() : Actual Use Rate

Understanding the Use of Motorcycle Helmet and ...

- 60 percent means



Preaching to the Choir



Conclusion

- Understanding motorcyclists' attitudes and behaviors is an essential step
 - Safety Ratings Sell Cars Not Motorcycles
- Combining RP and SP data can provide valuable insight
 - Response Bias
- Segmentation (Classification/Cluster analysis)
 - All motorcyclists are not created equal

Questions?

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