



Driver Preference for Fore-Aft Steering Wheel Location

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Background

SAE packaging practices provide guidance on driver seat position layout, but do not include driver preferences for steering wheel position.

What fore-aft steering-wheel location will be preferred by drivers?



Laboratory Study

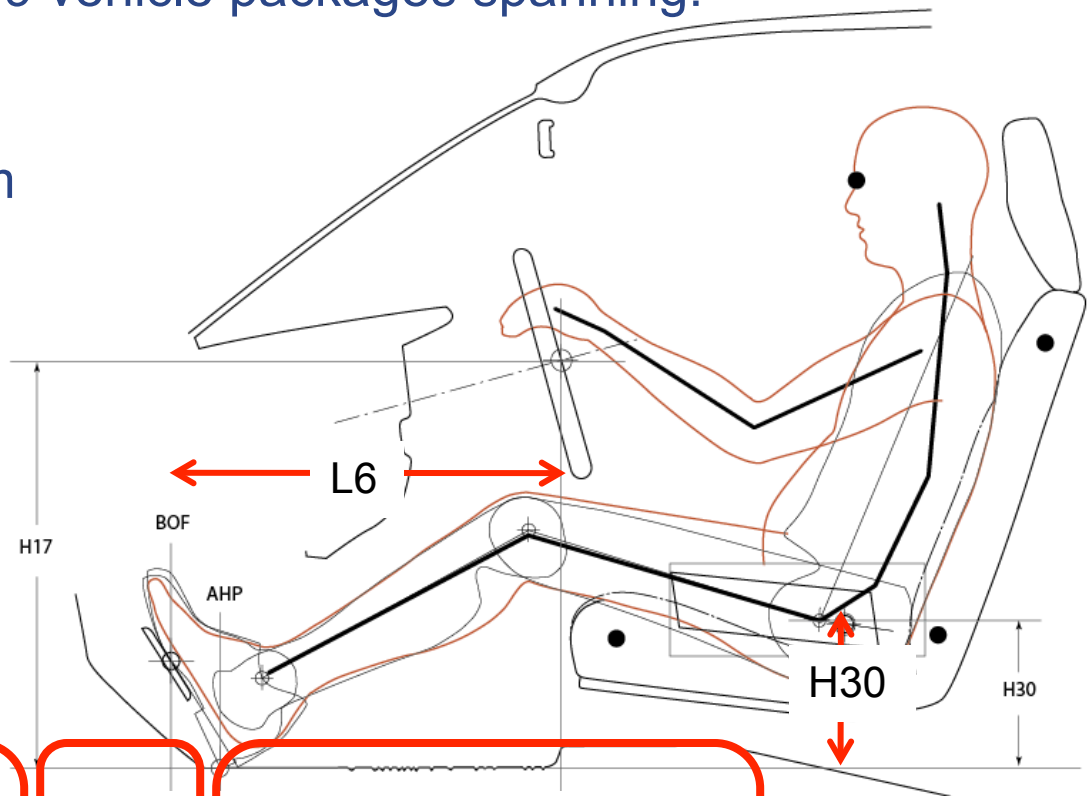
68 men and women with stature ranging from <5th-%ile female to >95th-%ile male for US population

Driver-selected seat position in 9 vehicle packages spanning:

H30: 180, 270, 360 mm

L6: 450, 500, 550, 600, 650 mm

Subjective rating of steering-wheel position



Too Close			Just Right	Too Far		
1	2	3	4	5	6	7

Vehicle Measurements

Convenience sample of 86
passenger cars, light trucks,
and minivans

Steering wheel fore-aft position
(L6) and seat height (H30)
measured with respect to pedal
reference points and SgRP
determined according to J4003
and J4004



Statistical Analysis

Logistic regression predicts binary outcomes from continuous independent variables

1. Record data as -1, 0, 1

2. Predict:

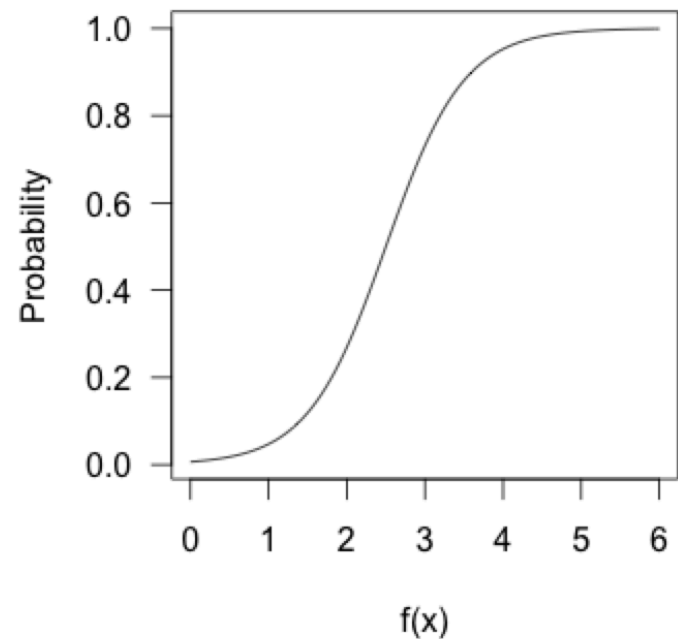
$P(\text{too close}) = P(x < 0) = -1 \text{ vs. } [0, 1]$

$P(\text{too close or just right}) = P(x < 1) = [-1, 0] \text{ vs. } 1$

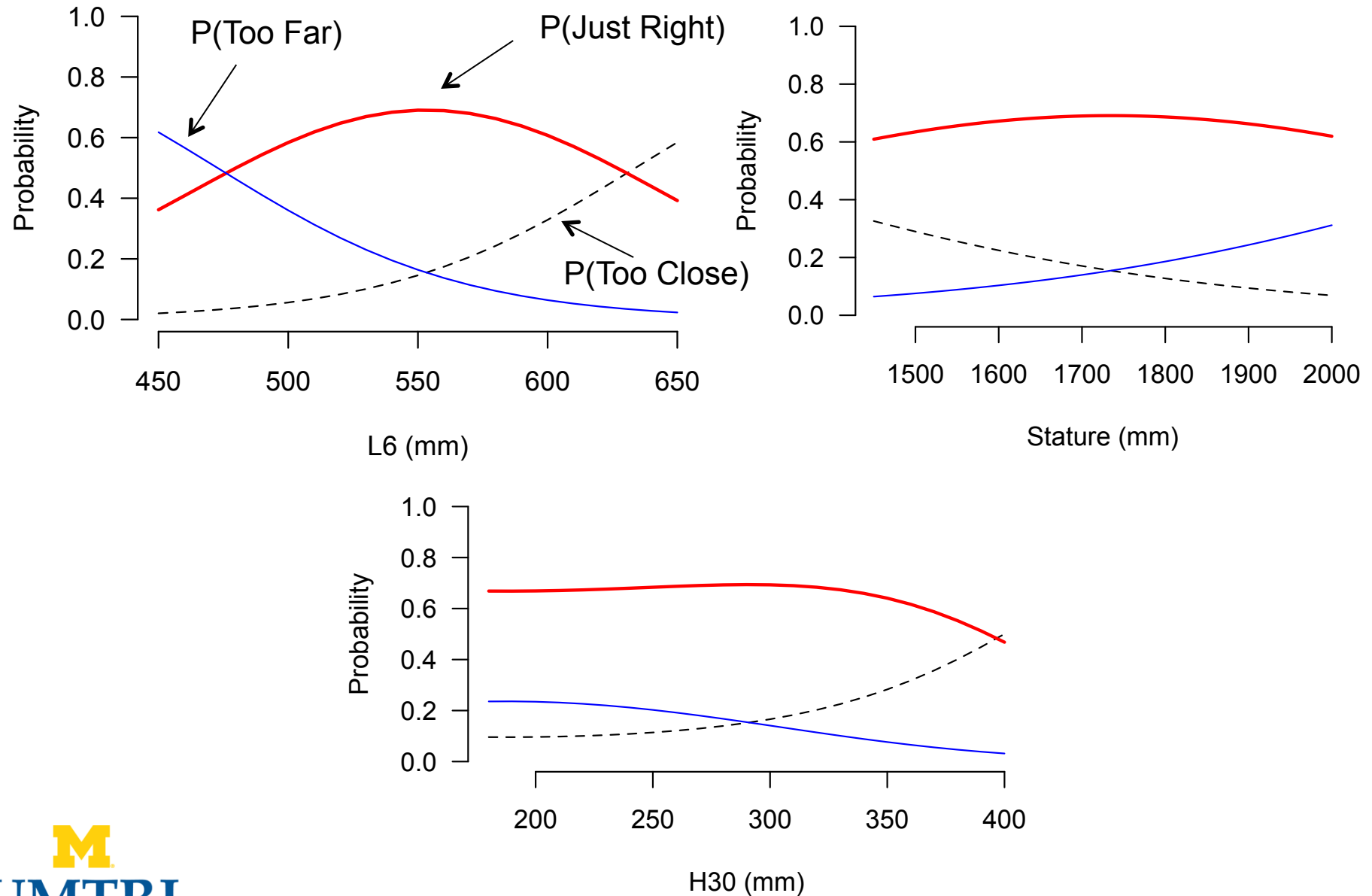
→ $P(\text{too far}) = 1 - P(x < 1)$

$$P = \frac{1}{1 + e^{-f(x)}}$$

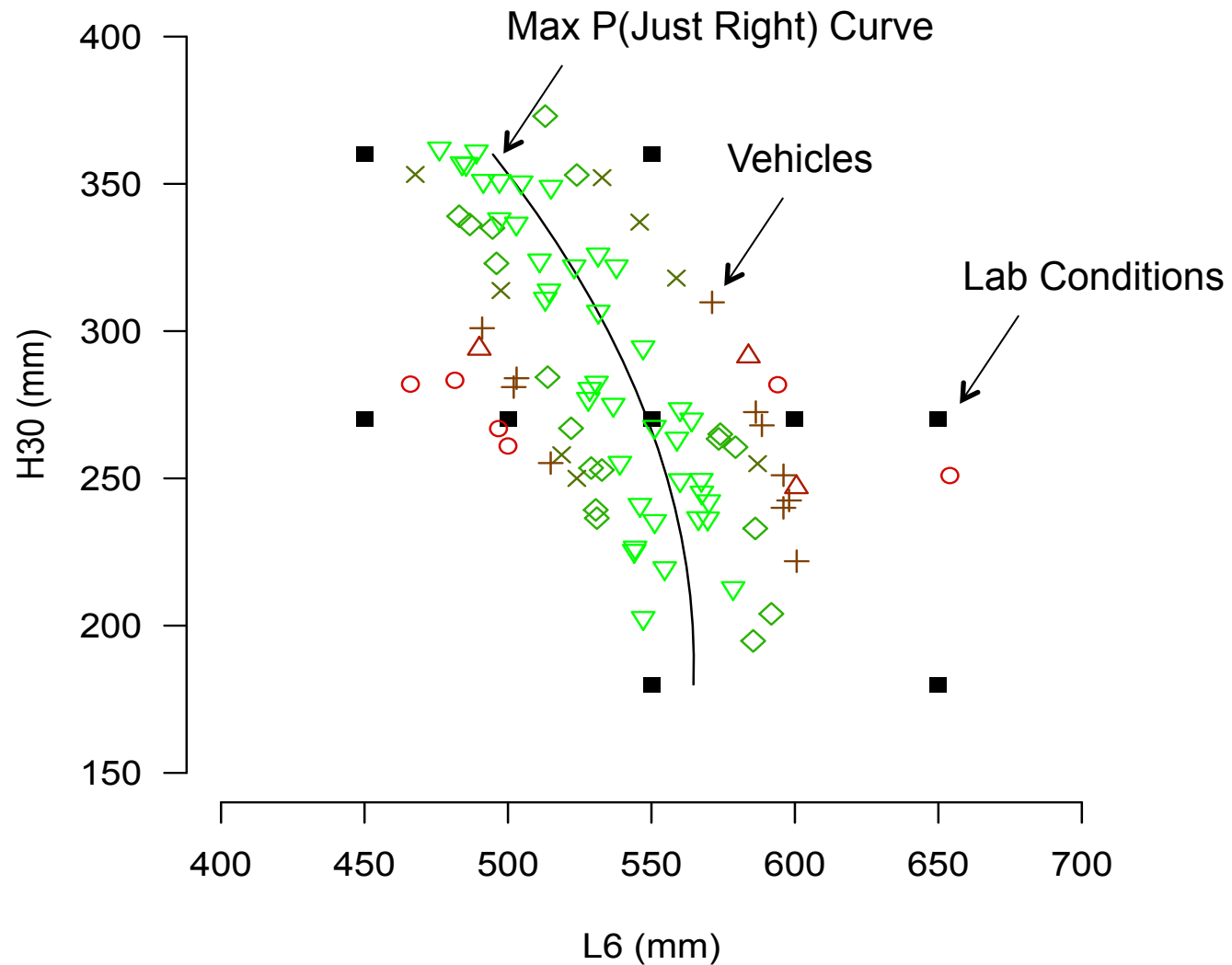
where $f(x) = f(\text{stature, L6, H30, H30}^2)$



Lab Results



Comparison to Vehicles



Discussion

- Fore-aft position preferences were surprisingly insensitive to body size
- Driving conditions might increase negative responses
- Lab results are broadly consistent with current design practice
- Steering wheel height (H17) could affect responses, but is constrained to a narrow range relative to H30 in practice
- Telescoping steering wheels need further research

Acknowledgment

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