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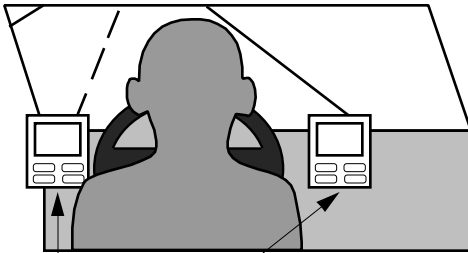
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## 1 ISSUES

1. Which display was glanced at more, the turn-by-turn or route map?
2. What factors affected glances to the turn-by-turn and route map displays?
3. When did display glances occur along the road segments?

## 2 METHOD

### On-the-Road Driving Scenario



Magellan PathMaster  
navigation units (2)

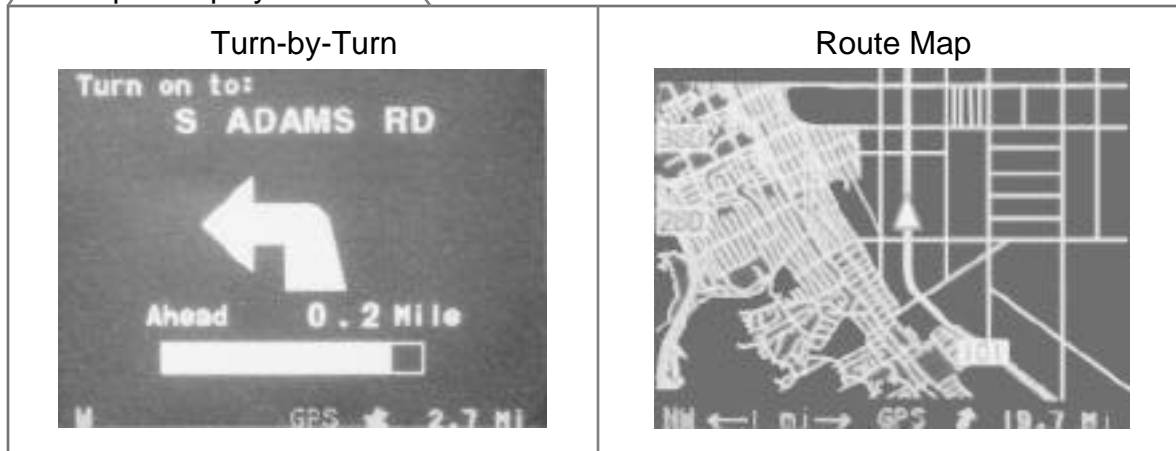
### Subjects

	Left	Right	Women	Men
Young (18-30)	map	turn	2	2
	turn	map	2	2
Older (65+)	map	turn	2	2
	turn	map	2	2

### Protocol

- Experimenter remotely enters destination from back seat
- Subject drives to destination using both displays
- Repeat for two practice destinations and six test destinations (total of 37 miles and 45 turns)

### Sample Display Screens

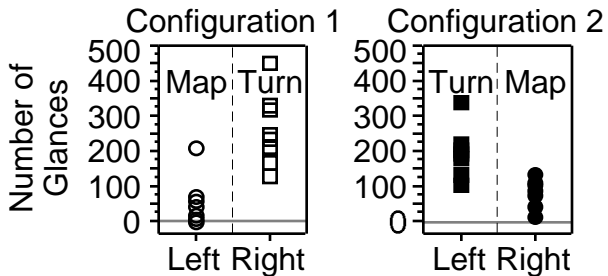


*(each 80% of actual size)*

## 4 RESULTS

### Issue 1 - Which display was glanced at most?

Overall display and location effects



- Turn-by-turn display glanced at 3.75 times more often than route map display
- Both displays glanced at more when on the right side of the steering wheel

### Issue 2 - What factors affected display glances?

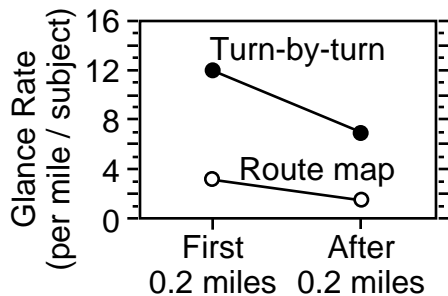
Age and gender effects



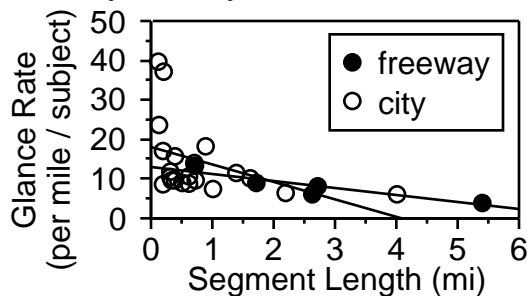
- Age and gender affected glances
  - young women similar to older men
  - young men similar to older women
- Average of 291 glances per subject (9.5 glances per mile over the 30.7-mile route)

### Issue 3 - When did display glances occur?

Glance rate summaries for freeway and city roads



- **Turn-by-turn display**
  - Burst of glances at segment start
  - Steady glance rate over remainder of segment, with slight increases when system spoke
- **Route map display**
  - Low uniform glance distribution



- Glance rate decreased as segment length increased
- Road type affected glance rate
  - City: 10.8 glances/mile/subject
  - Freeway: 6.9 glances/mile/subject

## 5 CONCLUSIONS

- Drivers relied primarily on the turn-by-turn display for navigation, not the route map.
- Glance rate was highest at the segment start, within 0.2 miles from the previous turn.
- Glance rate depended on the type of road being driven and the road segment length (7 to 11 total glances per mile for each subject was typical).
- In the U.S., navigation displays should be located to the right of the steering wheel, if possible.