



DESTINATION ENTRY WHILE DRIVING: SPEECH RECOGNITION VERSUS A TOUCH-SCREEN KEYBOARD

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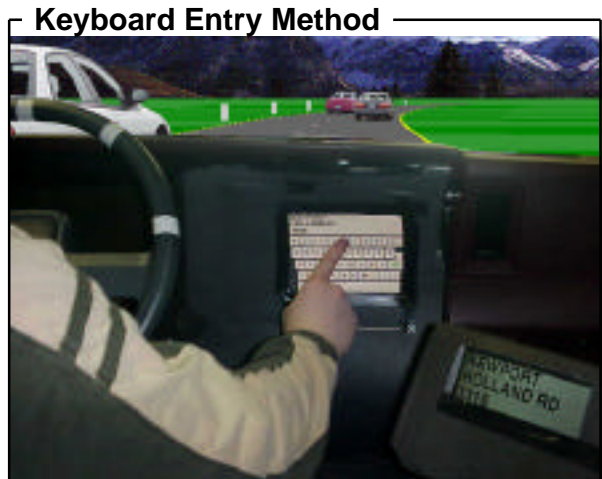
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1 Issues

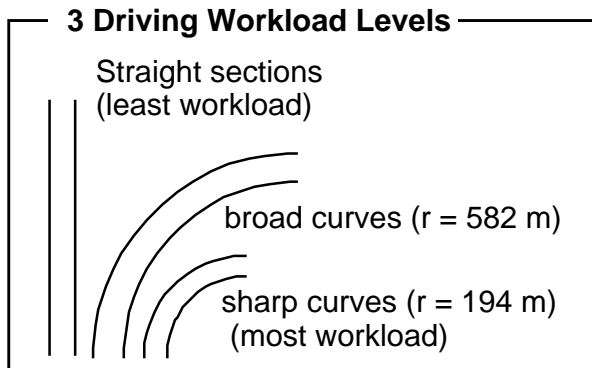
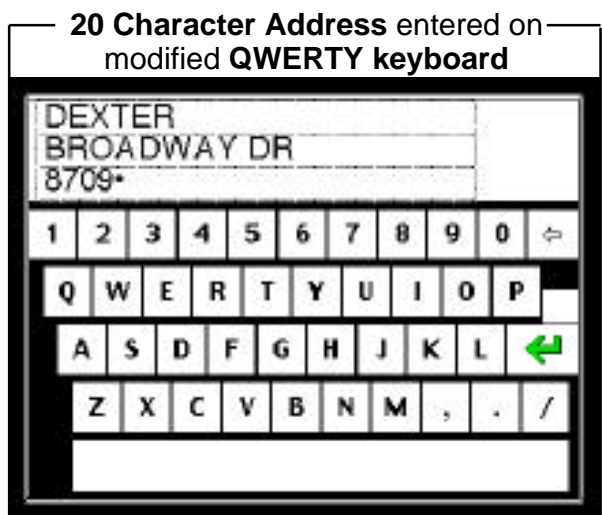
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| <p>1. Effect of <u>destination entry method</u> (speech recognition by word, by character, and touch-screen typing) on:</p> <ul style="list-style-type: none"> • task completion time (and errors) • concurrent driving performance • perceived difficulty and perceived safety | <p>2. Effect of <u>driving workload</u> (while parked, on a straight road, a moderate curve, and a sharp curve) on:</p> <ul style="list-style-type: none"> • destination-entry task performance • glance behavior • task partitioning (character entry) |
|--|--|

2 Test Method

| Destination Entry | |
|--------------------|----------------------------|
| Keyboard | Typed on touch-screen |
| Speech Recognition | |
| Word dictation | "DEXTER" |
| Character spelling | "D" "E" "X" "T" "E" "R" |



| 24 Subjects | Female | Male |
|---------------|--------|------|
| Young (20-29) | 6 | 6 |
| Old (65-72) | 6 | 6 |

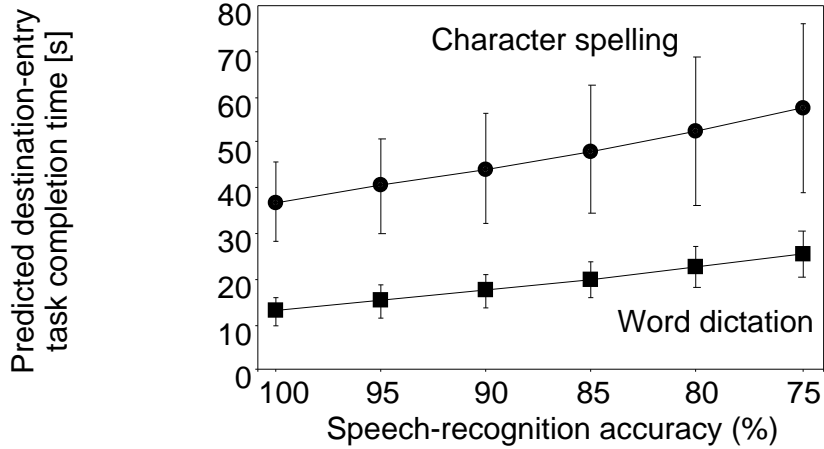
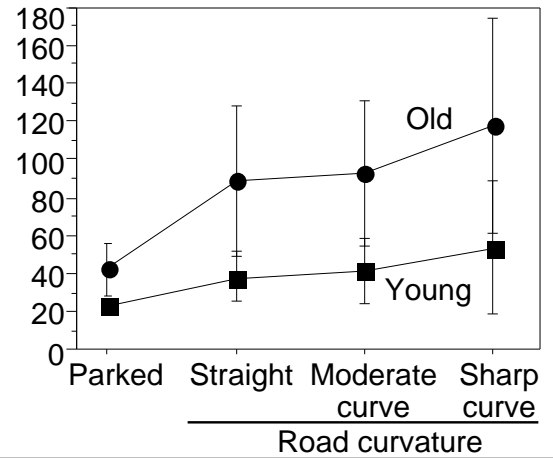
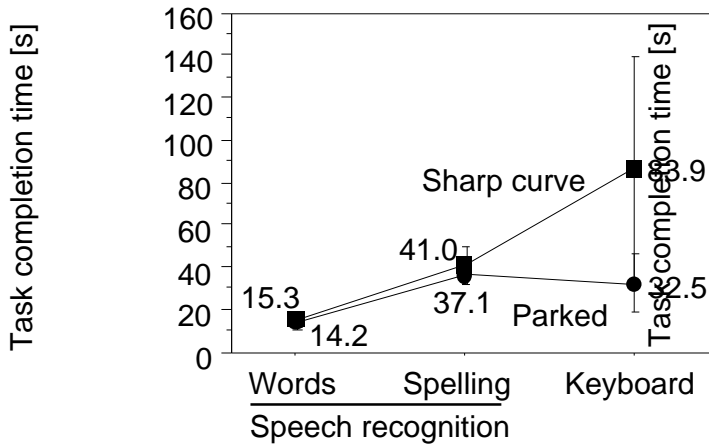


3 Results

Destination-Entry Performance

Task completion time while driving was shortest in word mode, and longest in keyboard-entry.

Task completion time with the touch-screen keyboard increased with increasing driving workload.



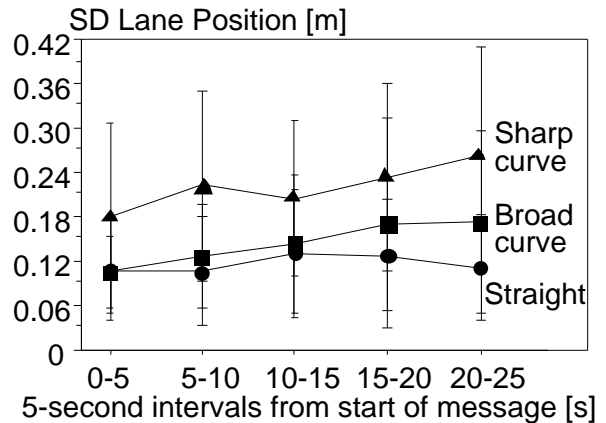
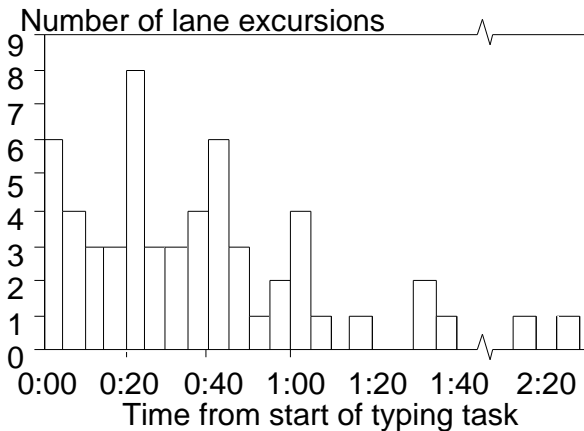
Mean entry-time per key

| | Enter Key | Space Key | Letters/Numbers |
|----------------|-----------|-----------|-----------------|
| Parked | 1.3 | 1.1 | 1.1 |
| Straight | 2.6 | 2.0 | 1.7 |
| Moderate Curve | 2.6 | 2.2 | 2.1 |
| Sharp Curve | 2.4 | 2.7 | 2.3 |

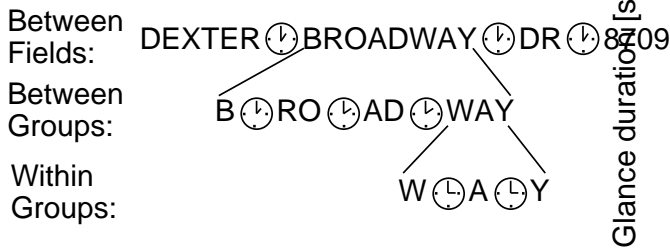
Driving Performance

Most first lane departures occurred within the first minute of the entry task.

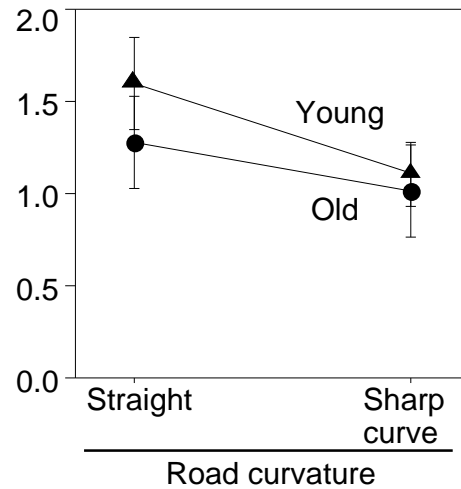
Standard deviation of lane position increased with elapsed time.



Task Partitioning



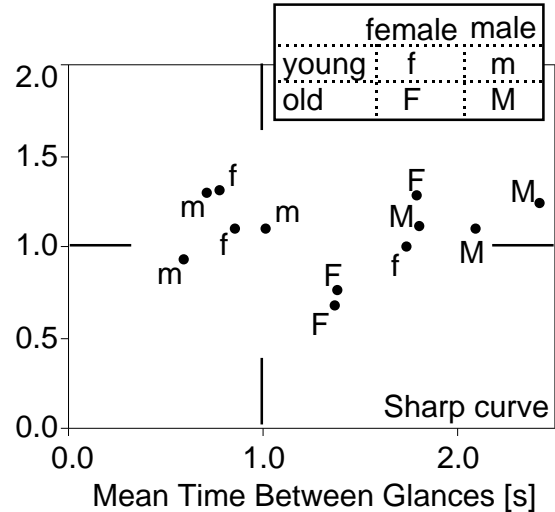
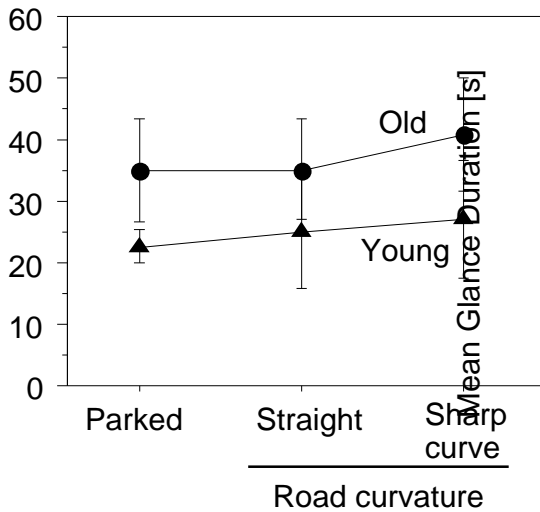
Pauses between fields (+57%) and between groups (+27%) increased as road curvature increased.



Total glance duration at the display remained relatively constant under all workload levels.

Glances at the display were consistent for all participants. Glances at the road by young participants were shorter.

Total glance duration [s]



Post-Test Subjective Rating

Driving rated more difficult than parked, and keyboard entry rated most difficult.

Keyboard entry rated least safe, and no method rated extremely safe.

