The Effect of Distractions on a Pedestrian’s Waiting Behavior at Traffic Signals: An Observational Study

By
George Gillette, Kay Fitzpatrick, Raul Avelar, and Susan Chrysler
Texas A&M Transportation Institute
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Distracted Walking

• Texting pedestrians (Seattle, 2012)
  • 3.90 times more likely to exhibit unsafe crossing behavior
  • 1.87 additional seconds to cross

• Pedestrian cellphone related injuries (United States, 2013)
  • 559 in 2004
  • 1506 in 2010
Objective

• To evaluate the effect of distractions upon pedestrian start-up time and crossing behaviors at signalized intersections
Study Sites

• Three sites in College Station, TX
• Maroon boxes highlight the monitored section

1 2 3

6 lanes, PSL = 40 mph
6 lanes, PSL = 40 mph
4 lanes, PSL = 35 mph
Methodology

• Manually collected in teams of two
• Recorded first pedestrian to arrive
Responses Recorded

- Start-up time
- Glancing prior to crossing
- Entering crosswalk early
Factors Recorded

- Group
- Estimated age
- Wait time
- Distractions
Factors Recorded – Group

• Pedestrians walking in groups (Western Washington University, 2009)
  • Walked slower than individuals travelling alone
  • Noticed unicycling clown more often

• This study used the following categories:
  • Peer group
  • Mixed-age group
  • No group
Factors Recorded – Estimated Age

• Older pedestrian crossing behavior (Seattle, 2012)
  • Decreased likelihood of unsafe crossing behavior in older age categories

• This study used the following categories:
  • <18
  • 18-25
  • 26-55
  • 56+
Factors Recorded – Wait Time

• Hypothesized that as pedestrians wait longer, they will become more likely to enter the crosswalk early

• This study measured:
  • Time between the moment the pedestrian arrives at the crossing to walking person signal
Factors Recorded – Distractions

• This study used the following categories:
  • Eating, drinking, smoking
  • Listening to music
  • Talking on a phone
  • Texting
  • None
Data – Overview

- 760 total recorded pedestrians
- 27 total hours of recorded observations
Data – Distractions

- Eating, drinking, smoking (6%)
- Listening to music (4%)
- Talking on a phone (3%)
- Texting (21%)
- None (65%)

Percentage of Total Observed
Results – Responses Recorded

• Start-up time
  • Average time: 1.79 seconds

• Glancing prior to crossing
  • 71% of all pedestrians glanced prior to entry

• Entering crosswalk early
  • 9% of all pedestrians entered the crosswalk early
Results – Comparison of Texting and Undistracted Pedestrians

![Graph showing the cumulative percentage of start-up time against the 85th percentile for Site 2: None (123) and Site 2: Texting (64).]
## Results – Significant Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Start-Up</th>
<th>Glancing</th>
<th>Entering Early</th>
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<tr>
<td>Distraction (Listening to Music)</td>
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<tr>
<td>Group (Peer)</td>
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<tr>
<td>Group (Mixed-Age)</td>
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<td>Wait Time (seconds)</td>
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<td>Opp – Obs Ped</td>
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<tr>
<td>Site</td>
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</table>
Conclusions

• Texting and talking on the phone had negative impacts upon start-up time

• Mixed-age and peer groups had different effects on pedestrian behaviors
Discussion

• A better understanding of start-up time and the factors that affect it
• Increased operations efficiency at signalized intersections
QUESTIONS?

Contact:
George Gillette
gillette1995@tamu.edu
Texas A&M Transportation Institute