Higher-order instruction by professional driving instructors: A naturalistic pilot study

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Number of casualty crashes by licence type

No. of drivers in casualty crashes

Learner licence phase

Provisional licence phase

Open licence phase

Years after licensing

Your learner is here
Graduated driver licensing: Queensland

• Learner phase
  – Logbook: ≥ 100 hours, ≥ 10 at night
    • 2 bonus logbook hours for each hour of professional driving instruction (capped at 30 hours)
  – 12 months duration

• Provisional phase
  – P1: vehicle and passenger restrictions
  – Hazard perception test

• Best practice in training and education? Goals of Driver Education (GDE)
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- Ability to generalise learning to new traffic situations
- Acquisition of higher-order skills (hazard anticipation)
- Poor hazard anticipation/reaction
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Higher-order instruction

1. **Generalises learning**: immediate other situations  
   e.g., Dangerous to drive at night as more difficult to see objects/movement

2. **Provides context**: describing why situation potentially dangerous  
   e.g., Pedestrian crossing is partially obstructed

3. **Emphasises underlying principles**  
   e.g., Higher a vehicle’s speed, the longer it takes to stop

4. **Includes estimates of prevalence and risk**  
   e.g., crash risk doubles when driver’s eyes off forward roadway ≥2 seconds
What actually happens during the Learner lesson?

• Parents
  – Most common supervisor - what is actually discussed during the lesson?
    Vehicle handling     Roadway features     Negative comments
    Navigation           Positive feedback     Driving-related questions
    Reassurance         Urgent warnings     Higher-order instruction

• Instructors
  – Average of 10 hours’ supervision in Queensland
  – Higher-order skills are fundamental for safe driving, but not of high concern when deciding if Learner is ready for independent driving
So what actually happens during the professional instructor/ Learner lesson?

- Code in-car communication
- Proof of concept
- Hypothesis generation
Method

• 6 Instructors (1 female)
  – Sunshine Coast region
  – One week recording period (43 lessons, range 1-22; 19 male Learners)
  – 56 surveys (matched 15)

• Two GoPro cameras fitted to vehicle
  – Camera 1: Capture forward roadway and verbal communication
  – Camera 2: Capture in-cabin non-verbal communication

• Each night
  – Lessons copied from GoPro to 1TB external hard drive
  – Batteries and BacPaks charged
Results

• Randomly selected 10 lessons (5 male Learners)
• Nvivo 10
• Five themes
  1. Introductory instruction
  2. Navigation
  3. Warnings
  4. Positive feedback
  5. Higher-order instruction
Introductory instruction

• 26% of the in-car verbal communication. Sub-themes:
  
  **Seat**  
  “When you hop in a vehicle you should always adjust your seat”

  **Brake**  
  “Push your foot on the brake”

  **Clutch**  
  “Clutch up further”

  **Accelerator**  
  “Don’t use the accelerator”

  **Moving**  
  “Add power and put the handbrake down, we’ll go forward”

  **Gear**  
  “Before you change down the gear use your brake”

  **Steering**  
  “So that’s the best position to drive in”
Help navigate

• 12.5% of the in-car verbal communication. Sub-themes:
  
  Lane merge  “Get into the next lane before you actually cross the dotted line”
  
  Left turn  “Left indicator to tell anyone behind you what you are doing”
  
  Right turn  “Time to get into the right lane, so mirror, indicator, shoulder check, and merge as soon as you can where it’s safe”
  
  Roundabout  “Through the roundabout, as you’re turning, make sure you stay close to the right side”
Warning

• 15% of the in-car verbal communication. Sub-themes:

  - **Blind spots** “Always make sure to check your blind spot before you start going”
  - **Shoulder check** “When you go to take off, change lanes, turn, roundabout, you have to do that mirror, indicator, and shoulder check”
  - **Mirror** “When you are moving to your right, check your right mirror”
  - **Indicator** “Indicate in good time”
  - **Clutch** “Don’t put the clutch in that early”
Positive comments

• 10.5% of the in-car verbal communication. Sub-themes:

  Good turning  “Very nice. Alright, no problem with that one”
  Early braking “You brake plenty in advance if there’s someone coming up behind you, right there is good”
  Lane merging “You’re going to merge, the speed of these oncoming cars, pick your speed up, nice early plan of attack”
  Gear changing “That was a real good gear change”
  Car positioning “Your road position is good”
Higher-order instruction

• 35% of the in-car verbal communication. Sub-themes:
  Reading signs  “You might remember that the sign shows road swings very sharply up ahead, at the dead end” (generalise)
  All checks  “While you are driving away keep your eye on the centre of the lane, keep thinking ‘check’ so you can see who might be coming up behind you” (generalise, contextual learning)
  Watching front traffic  “If you are looking at the upcoming traffic, you could drive that direction” (underlying principles)
  Hazard perception  “This is a park, so you’re going to slow enough to brake quickly in case a kid or something ran” (contextual learning; underlying principles)
Proof of concept?

• Positive experiences
  – Trouble-shooting pilot project essential prelude to larger project
  – Instructors recruited, Learners consented-to-participate
  – Recording protocol successful
    • GoPros captured images (roadway, in-cabin)
  – Online surveys successful
    • Completed via Instructors’ tablets in vehicle
  – Verbal communication classified
    • 5 categories, proportions differed from the parent-Learner study
Proof of concept?

• Less-positive experiences
  – Batteries and BakPaks wouldn’t hold charge
  – Time-consuming activities
    • Downloading recordings
    • Charging batteries and BakPaks
    • Transcription
    • Coding instruction (only one Coder)
  – Surveys problematic if consecutive lessons scheduled
  – Transcription difficulties
    • Noisy roads and vehicles
    • Quiet conversation
Hypothesis generation

• Research needs
  – A larger, more representative sample of Instructors (and Learners)
  – A longer sampling timeframe
  – A reliable and GDE-relevant coding taxonomy
  – To identify missed opportunities (translate teachable moments)
  – To explore within and between Instructor variability
  – To explore perceptions of Instructors and Learners regarding lessons
  – To identify if higher-order instruction is related to independent driving performance
Questions?

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