The First Year of Driving – Can IVDR and Parental Involvement make it Safer?

מחקרים חדשים בתחום הבטיחות בדרכים

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טכניון – חיפה

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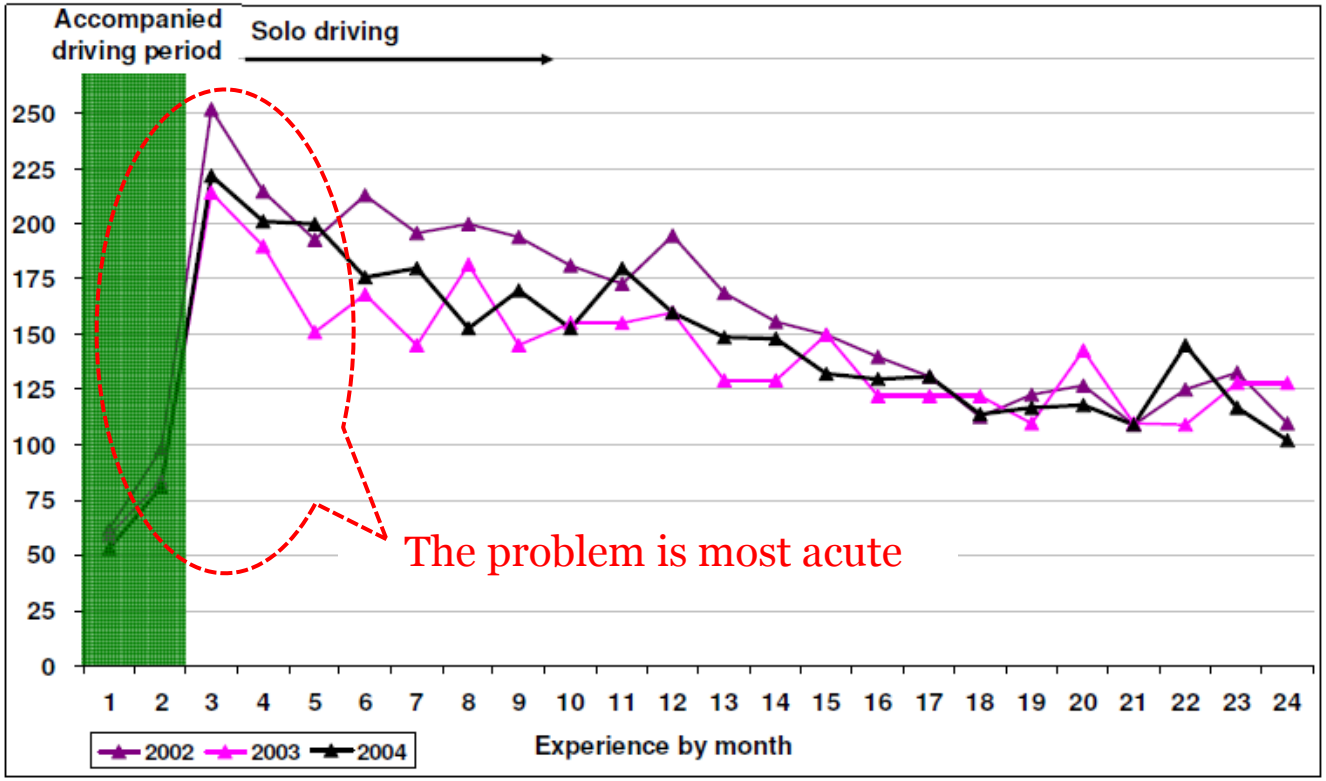
Involvement of Young Novice Drivers in Crashes

- Novice young drivers are overrepresented in road crashes;

Young drivers involved in car crashes by experience (2002-2004)



Lotan & Toledo (2007)

Graduated Driver Licensing System

- The high involvement in road crashes:
  - received considerable public and media attention;
  - led to the graduated driver licensing system;
- Nowadays in Israel several restrictions apply on young drivers:

Accompanied driving
(first 6 months)

Age	Driving Experience
>24	≥ 5 years
>30	≥ 3 years

50 hours minimum:
20 urban, 15 rural, 15 night

Number of Passengers
(first 2 years)

No more than two passengers, unless when accompanied by an experienced driver.

Blood Alcohol Content (BAC)

BAC	Drivers
0.01%	< 24 years

Research using IVDR

The IVDR system measures G-forces and GPS locations.

IVDR

Measurement Tool

- Observing naturalistic driving behavior;
- Identifying critical maneuvers;

(Lotan & Toledo, 2007; Lerner et al., 2010)

Intervention Tool

By providing feedback to drivers and thus affecting their risky behaviors.

(McGehee et al., 2007; Carney et al., 2010; Farmer et al., 2010; Prato et al., 2010)

Parental Monitoring

- Many parents did not make full use of IVDR technology or even rejected it completely *(Farmer et al., 2010; Guttman et al., 2010)*;

- Parents need guidance on how to:
  - motivate the young driver to use the feedback effectively;
  - avoid conflicts with them around the feedback.

- Teens with authoritative parents are less involved in unsafe behaviors *(Ginsburg et al., 2009)*;

Participants and Recruitment

- A rolling recruitment procedure was used (07/2009 – 11/2010);
- Candidates were required to meet several screening criteria:

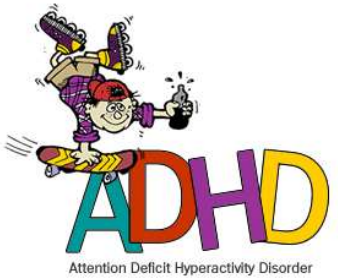
Male young drivers

Licensed recently
(driving experience up-to 1.5 month)

Live in the central part of Israel

Drive the family car
(i.e. do not have their own car)

Their parents have access to the internet



Do not have untreated ADHD

Final Sample of Participants

- 242 young drivers and their families;
- Of these, 217 completed the one year period;
- Young drivers' average age 17.5 (±0.8);
- Participating families received 1000 NIS (approximately $250).

Drop-off rate of 10.3%

Data Collection

Naturalistic data was collected *Using IVDR systems*:

- Driver identity;
- Trip start/end time;
- Vehicle GPS location;
- Events of excessive maneuvers:
  - Defined by patterns of G-forces;
  - Classified: speeding, braking, accelerating, turn and lane handling

Personal magnetic identification (“Dallas”) keys

IVDR

Experiment Design

Participating families were randomly allocated into one of four groups:

Control

Individual Feedback No Guidance

Family Feedback With Parental Guidance

Family Feedback No Guidance

Family members, except for those in the control group, received feedback starting from the Solo phase.

Feedback to Drivers

Participants received feedback on their driving aggressiveness level.

Online

In-vehicle display

Real- time feedback unit

Off-line

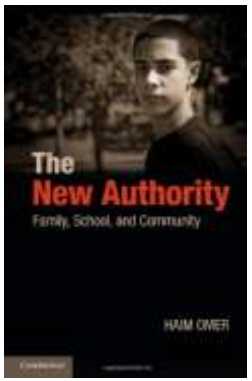
Web-based application

Color	Aggressiveness Level	Number of excessive manuevers per 10 driving hours
Green	Moderate	0-20
Yellow	Intermediate	21-50
Red	High	>50

Guidance to Parents

The New Authority (NA) approach helps parents handle the difficulties, and increase their involvement and monitoring ability (Omer 2004, 2011).

The parents are guided to link their level of involvement to the level of driving aggressiveness:



- Aggressive young driver
- Highest parental involvement
- ”Protective action”

- Intermediate driver
- Intensified parental involvement
- ”Focused alertness”

- Moderate driver
- Minimum parental involvement
- ”Open attention”

For each of the levels of vigilant care, specific parental tools were developed.

Guidance to Parents

- Administered in a **90 minute meeting** at the family's home;
- **Both parents and the young driver** were invited to the meeting;
- **Written material** was provided with instructions on how to implement the guidelines to increase its effectiveness and minimize escalation;
- **3-4 bi-weekly phone conversations** were initiated by the counselors to help the parents better cope with the difficulties they face.

Family Feedback With
Parental Guidance

Research Questions

(1) Does providing young male drivers with feedback about their driving affect their driving safety?

(2) Does providing parents with feedback on their teen's driving affect his driving more than a self-regulated feedback?

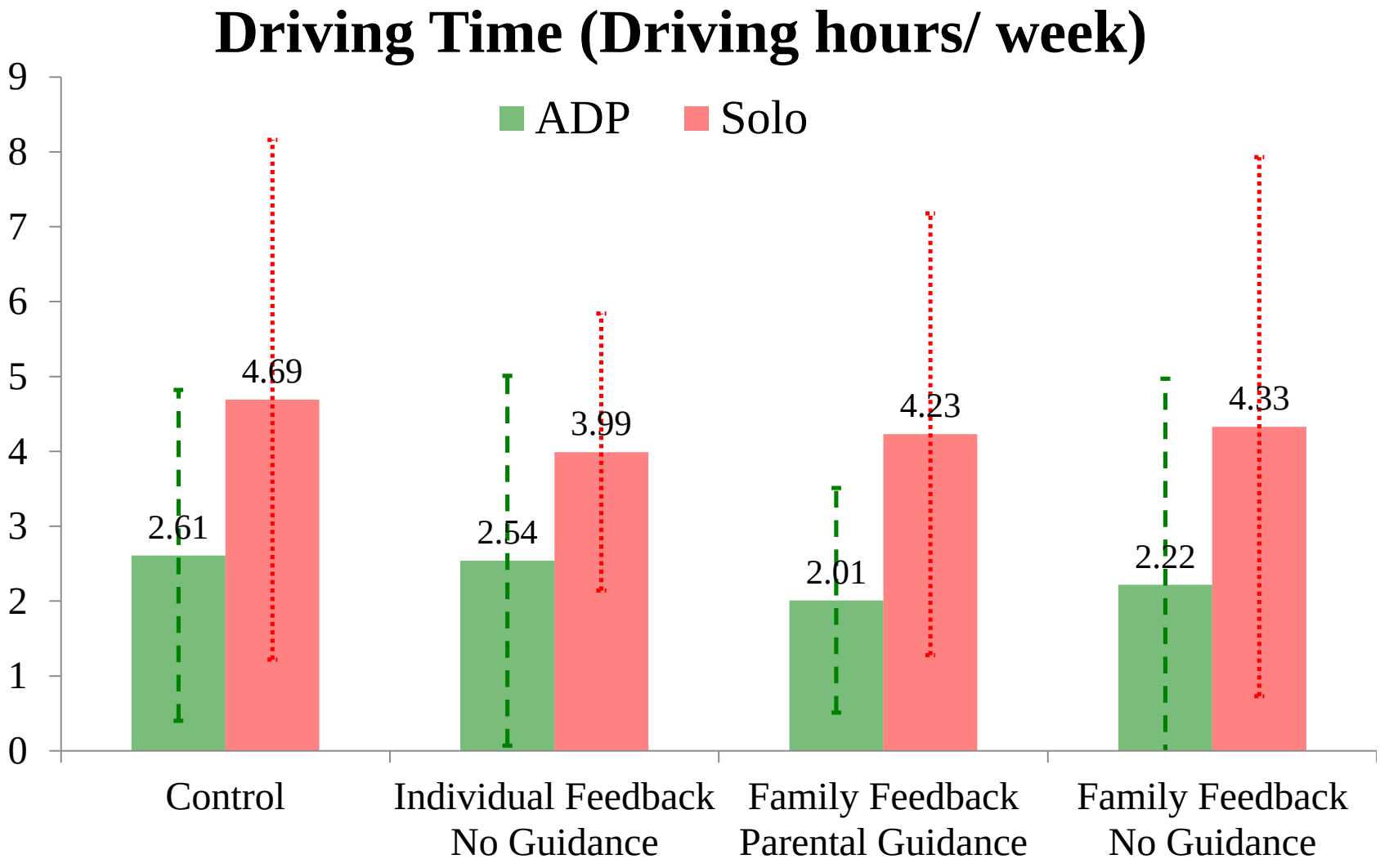
(3) Does providing parents with guidance on how to be more involved and exercise vigilant care with the help of IVDR increases the benefits of its use?

Data

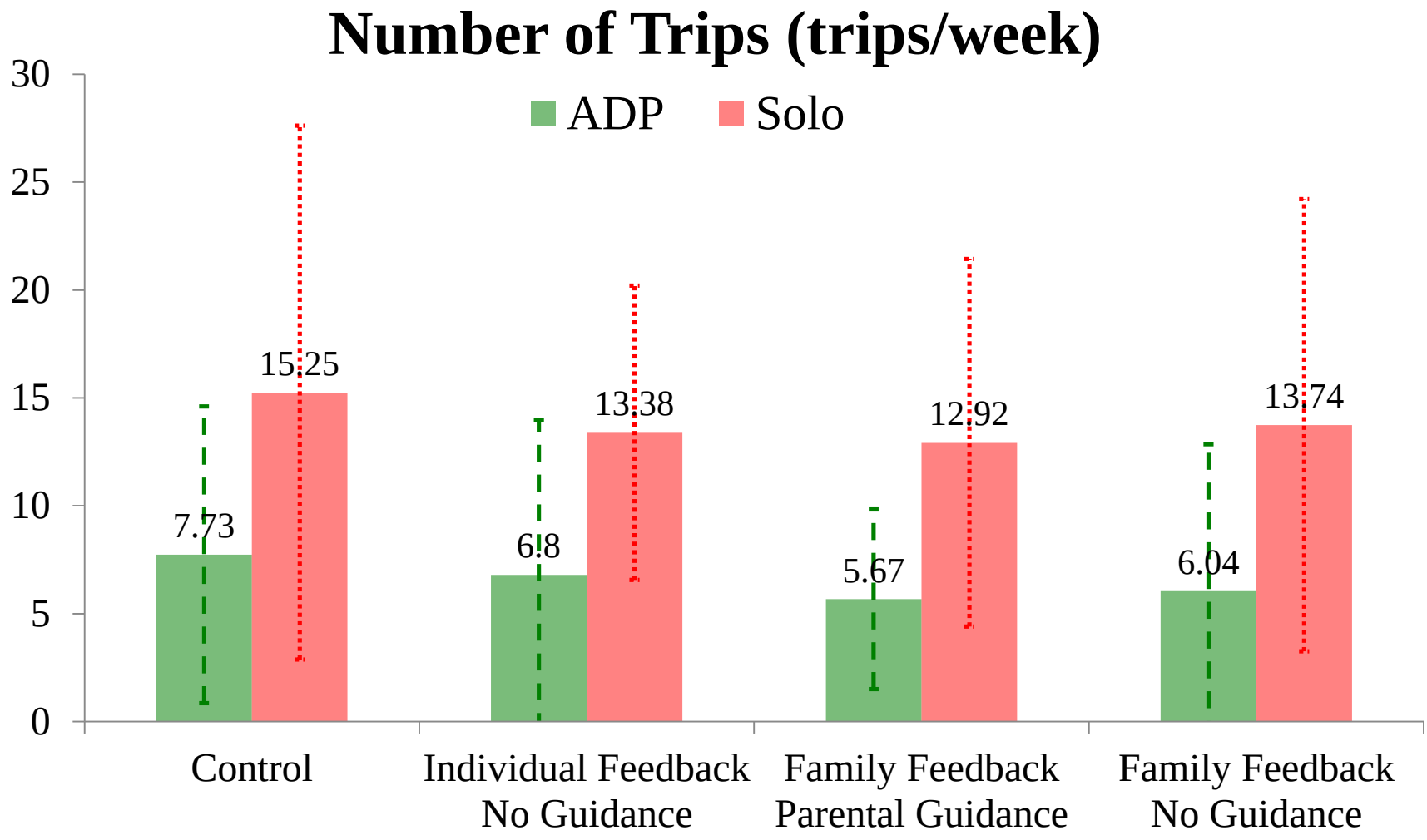
	Family Feedback No Guidance	Family Feedback with Parental Guidance	Individual Feedback No Guidance	Control
				
Number of young drivers	56	55	53	53
Number of ADP trips	2491	2513	2680	3196
Number of solo trips	33846	32623	33146	33872
ADP driving time (hours)	945.7	907.2	993.2	1072.5
Solo driving time (hours)	10655.0	10612.2	9860.9	10248.4

Results of the Amount of Driving

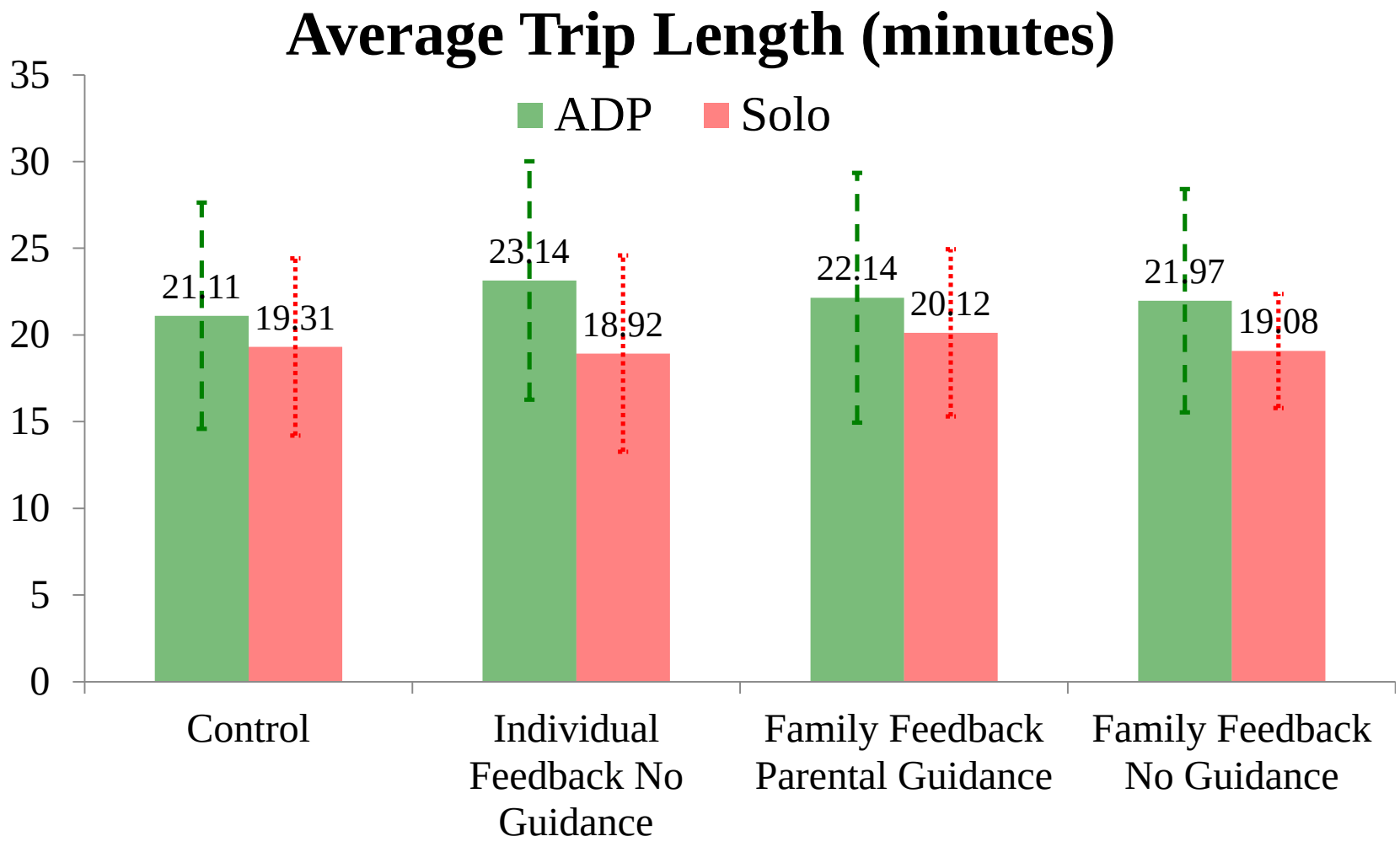
Amount of Driving



Amount of Driving (Cont.)

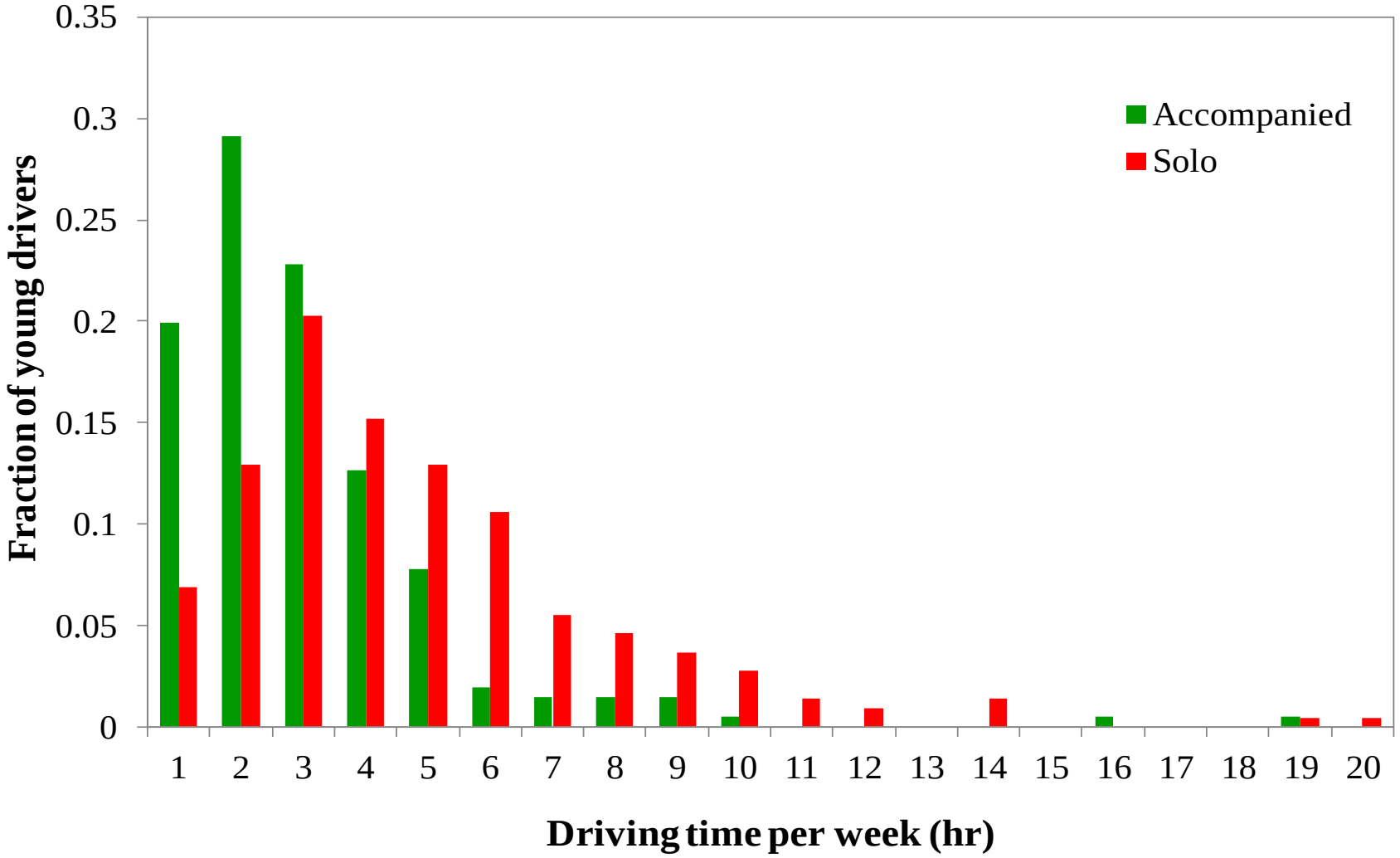


Amount of Driving (Cont.)



Amount of Driving (Cont.)

Distribution of the weekly driving time among young drivers:



Results of the Driving Behavior

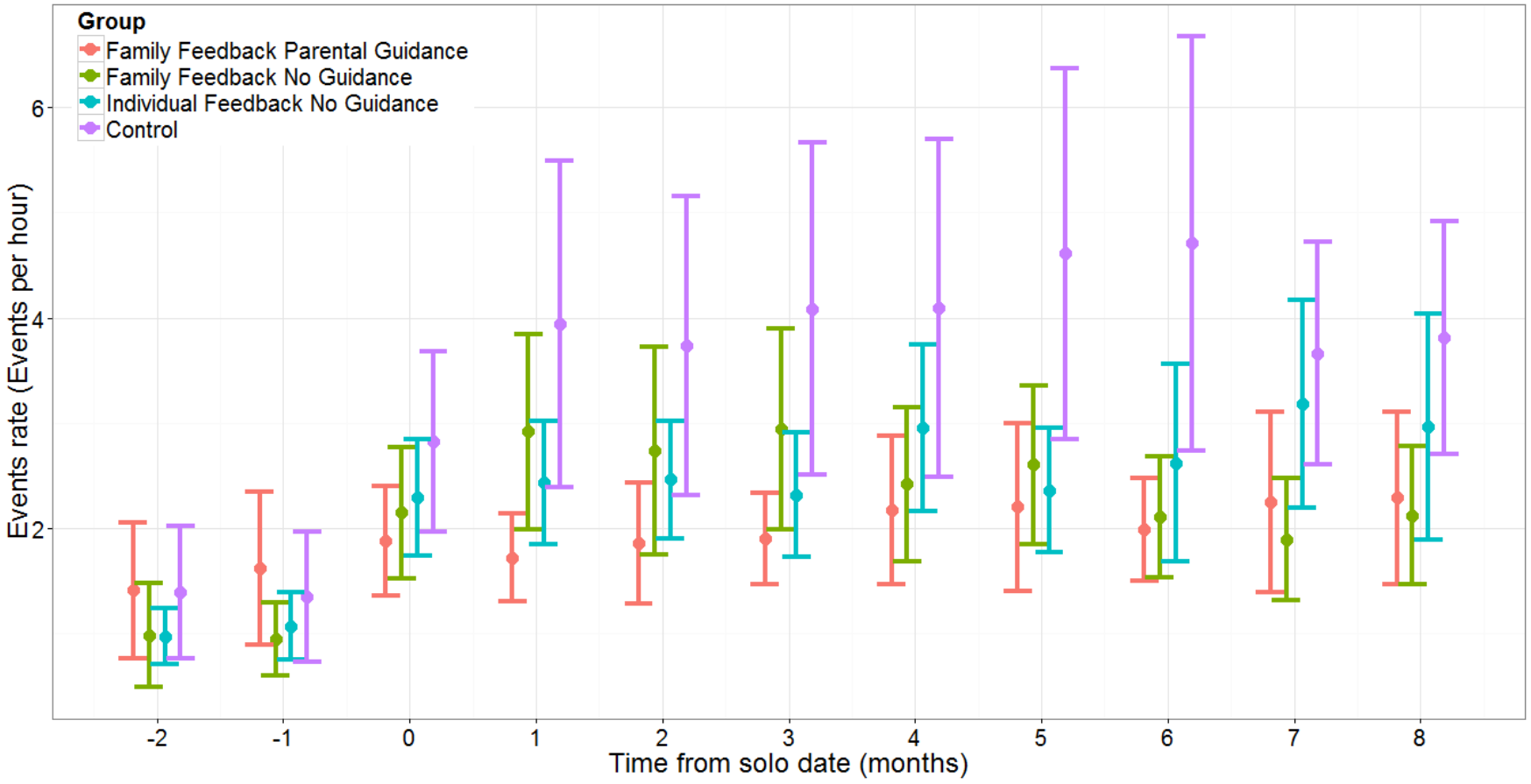
Driving Behavior

Driving behavior is measured by the number of excessive maneuver events normalized by the number of driving hours.

	Events Rate Average (std)	
Group	**Accompanied**	**Solo**
Control	1.43 (2.14)	3.85 (4.91)
Individual Feedback No Guidance	1.07 (1.30)	2.89 (4.32)
Family Feedback Parental Guidance	1.56 (2.42)	2.01 (2.43)
Family Feedback No Guidance	1.13 (1.95)	2.43 (2.80)
Overall Sample	1.27 (1.77)	2.76 (3.28)

Driving Behavior (Cont.)

This figure presents the average events rates over time for the four groups:



Summary & Conclusions

- Young male drivers increase their exposure in the Solo phase;
- The combined effect of family feedback and parental guidance leads to statistically significant improvement when compared to the control group.

Thank you!

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