The effectiveness of an Occupational Therapy metacognitive-functional intervention for the improvement of human risk factors of bus drivers

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החוג לריפוי בעיסוק
בית הספר למקצועות הבריאות
ע"ש סטנלי שטייר
הפקולטה לרפואה ע"ש סאקלר
אוניברסיטת תל אביב

Introduction:

-Risk factors of driving

-Scarce research-based evidence concerning the ability to improve the driving skills of drivers

-In particular of bus drivers (Classen et al., 2014; Broughton et al., 2003).

Occupational therapy and driving

-To examine new ways of intervening

-Applying different strategies to reduce risk factors (Pellerito, 2006).

OT metacognitive-functional intervention

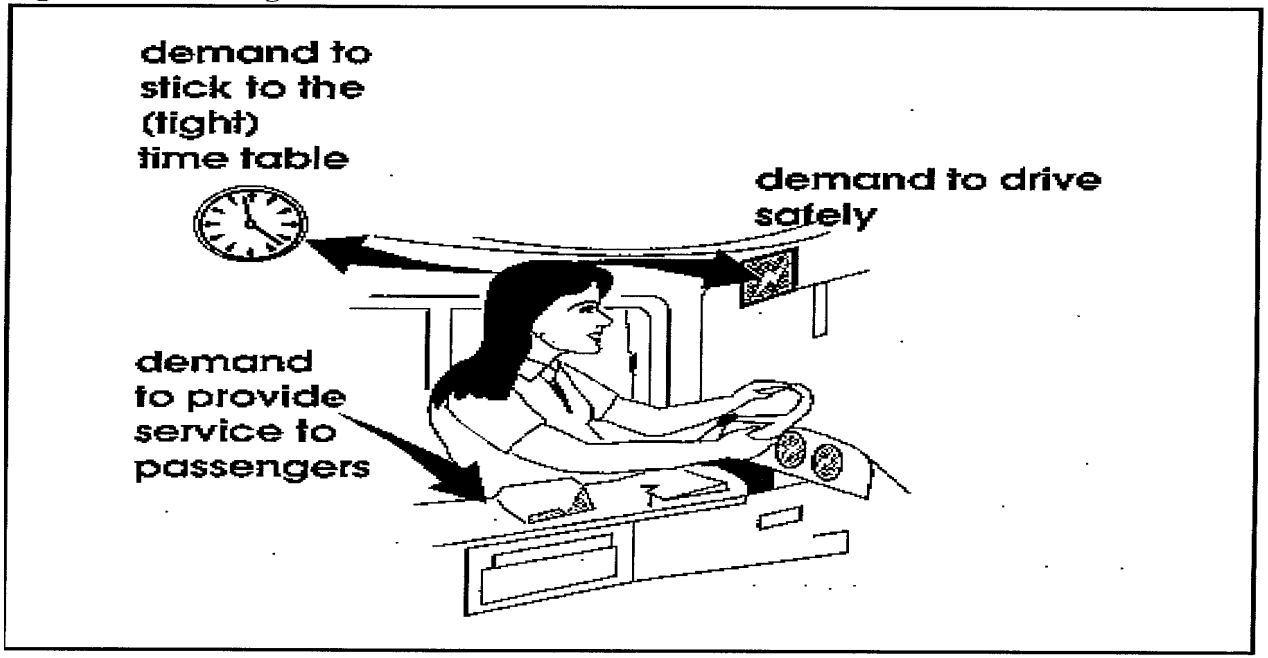
- Increase drivers' consciousness to their way of driving.

The research model

- Driving as an Everyday Competence (Lindstrom-Forneri, et al., 2010).
- Interaction between individual and environment moderated by beliefs and awareness, leading to strategic level decisions regarding driving behaviors.

The DEC model was adjusted to the professional driving in public transportation line of work and its particular risk factors

Figure 3. Conflicting task demands



Objective

- To examine the effectiveness of a metacognitive-functional intervention program for the reduction of risk factors among professional drivers relative to a control group.

The intervention

- Raising awareness to safe driving risk factors
- Ergonomic, perceptual-cognitive and on-road driving data
- Reference to the difficulties that the driver raised
- Providing coping strategies.

Three sessions of two hours each.

Control group

The employer's routine intervention:

- Covert inspections detecting troublesomeness while driving
- Conversations
- Records in the drivers' personal files

Materials and methods:
Participants

- This study is a short-term follow-up
- Seventy seven professional male bus drivers from a large bus company in central Israel
- Twenty-one drivers continued to the intervention stage; four of them dropped out before the end of the intervention.

Meta-Cognitive-Functional Intervention Program Tools

Objective measures:

- In-Vehicle Data Recorders (IVDR)
- G sensors events
- Traffic accident data before and after the intervention

Subjective measures:

- Occupational performance questionnaire for bus drivers

In Vehicle Data Recorder (IVDR)

Unsafe events that occurred during the trip

sudden lane deviations (LD)	Unsafe Headway Distance (HW)	Urban Forward Near-Collision (UFNC)	Intercity Forward near-collision (IFNC)
Event is registered whenever unplanned deviations without signaling occur.	Event is registered whenever the driver goes down within less than a second from the vehicle in front of him.	Event is registered whenever the driver goes down from 2.7 seconds from the vehicle in front of him.	Event is registered whenever the driver goes down from 2.7 seconds from the vehicle in front of him.
Active from 55 kph or higher and therefore more adapted to long-distance travel.	Active from 30 kph or higher.	Driving up to 30 kph; for slow speeds of traffic jams in the city.	Active from 30 kph or higher

G sensors

- Number of accelerations above threshold limit
- Number of sudden braking
- Number of high speed turns

Occupational Performance Questionnaire for Bus Drivers:

- We developed an occupational performance questionnaire, based on interviews with bus drivers

- To detect main problems that bus drivers deal with in their daily routine.

Occupational Performance Questionnaire for Bus Drivers:

- Contains 50 every day driving situations.
- Level of performance
- Level of satisfaction of that rating.

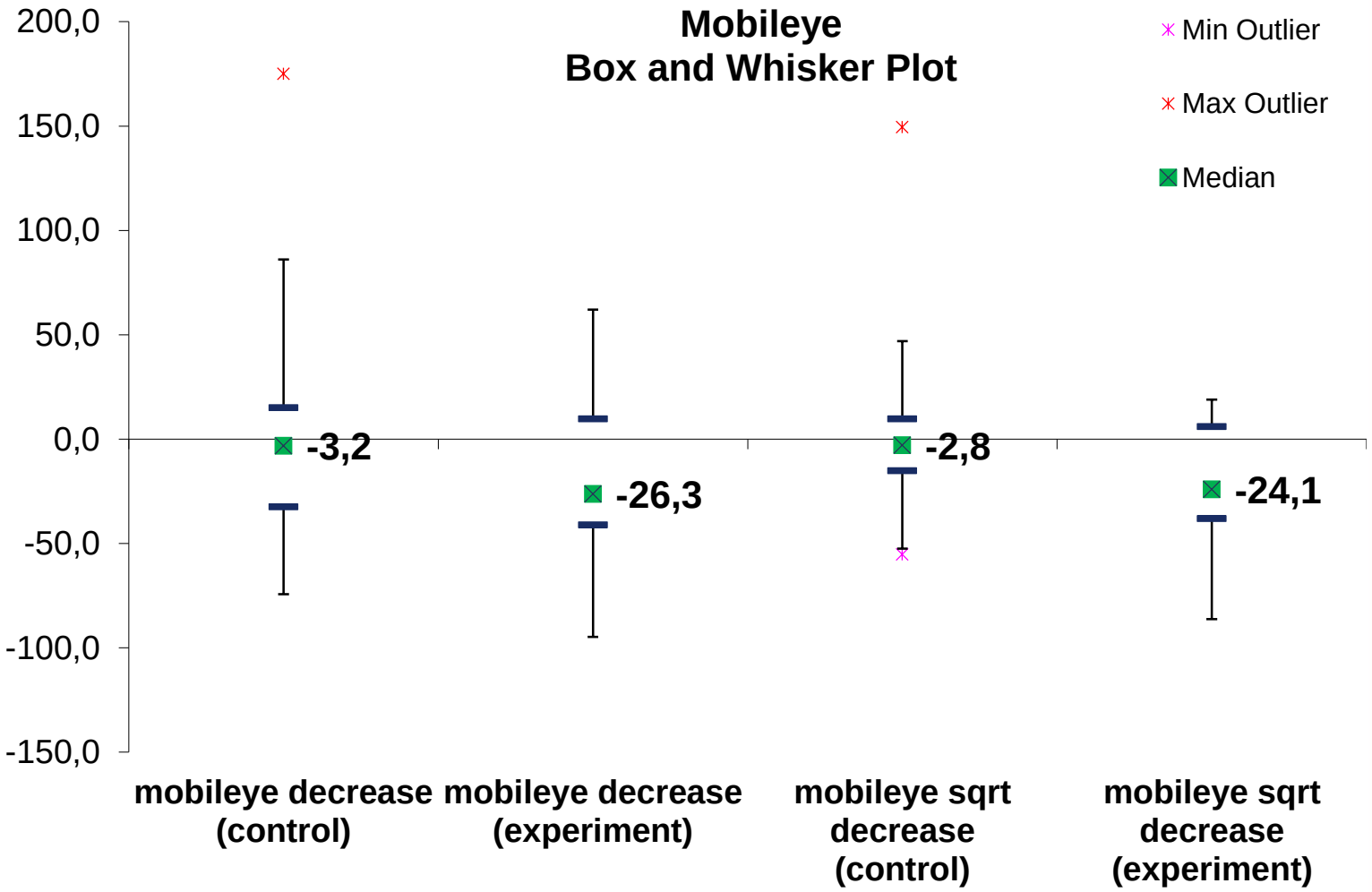
- Set the individual goals of the intervention program and to follow subjective outcome measures.

Crashes records

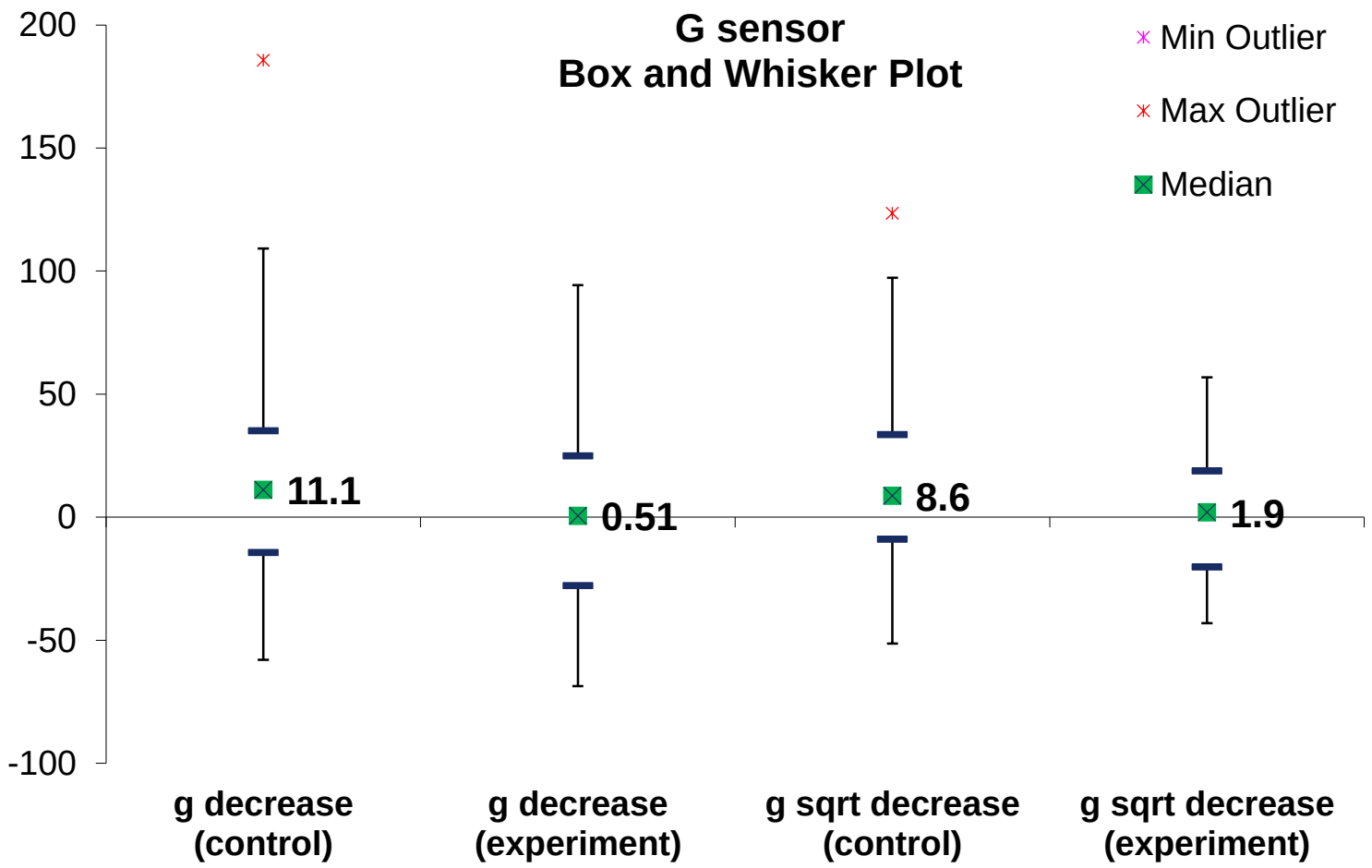
- Number of accidents recorded in the last year before and one year after participating in our research.
- The data was provided by the bus company.

Results

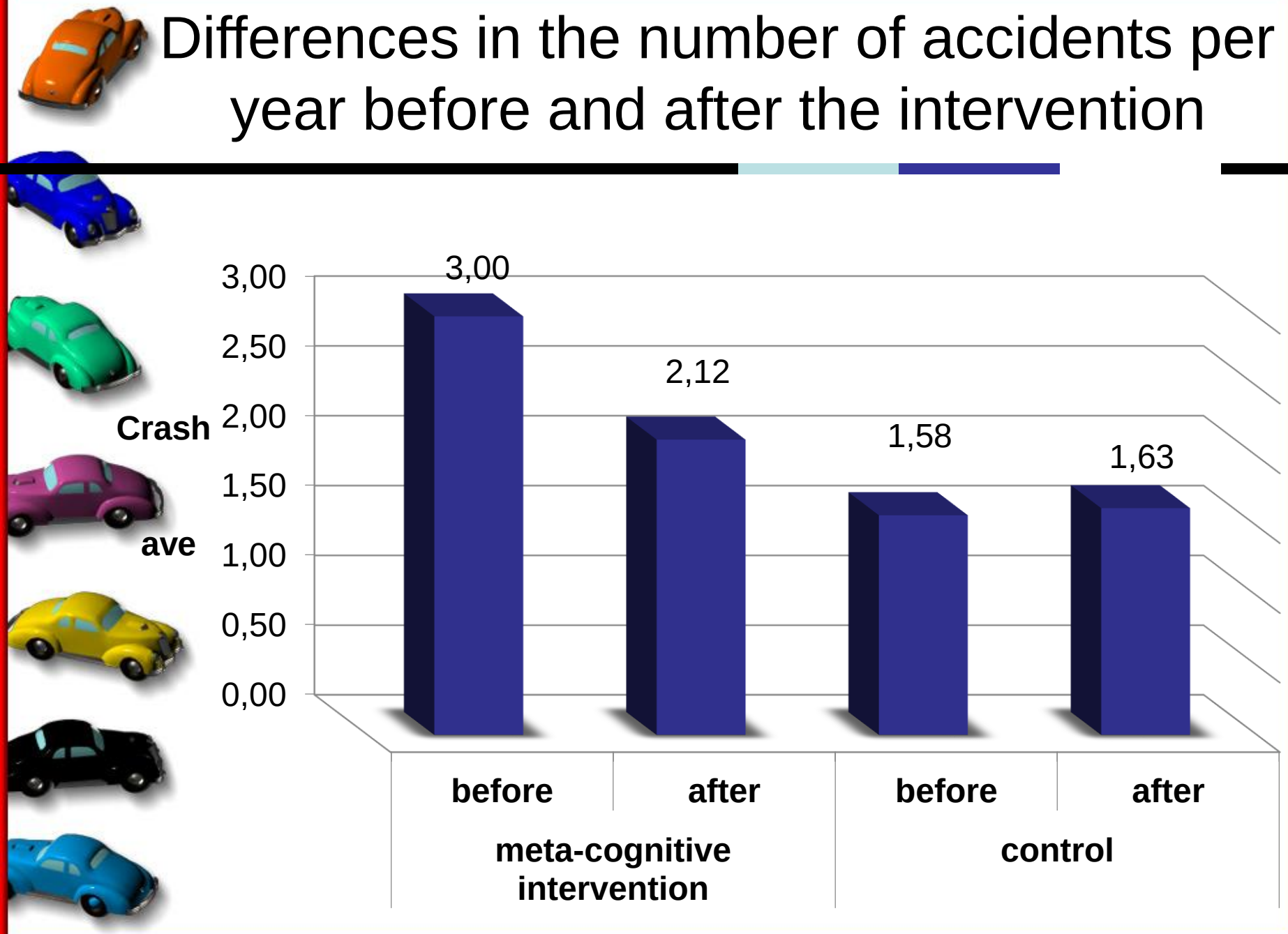
Difference between the degree of change in the rate of Mobileye perilous events before and after the intervention



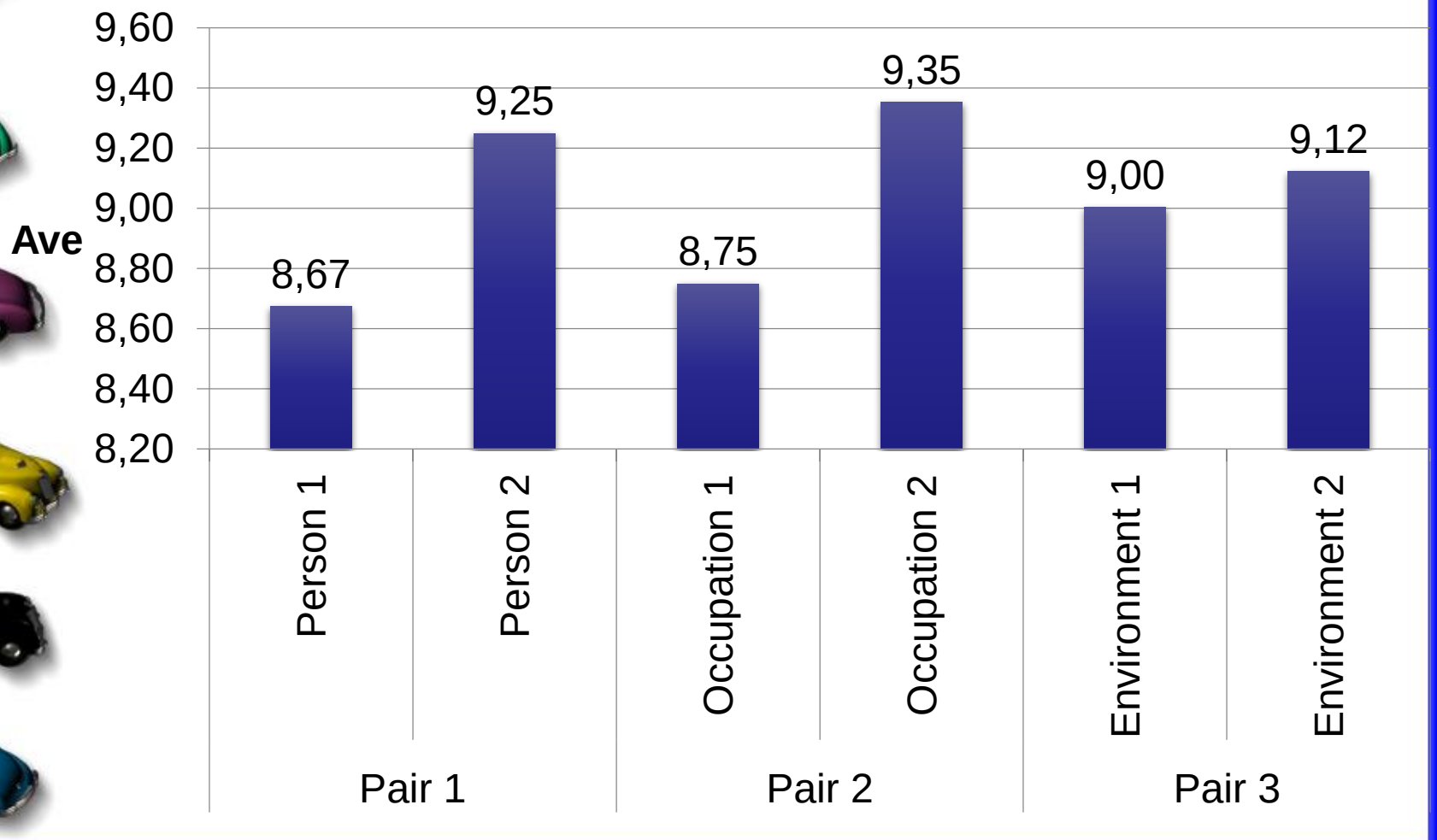
Difference between the degree of change in the rate of G sensor perilous events before and after the intervention



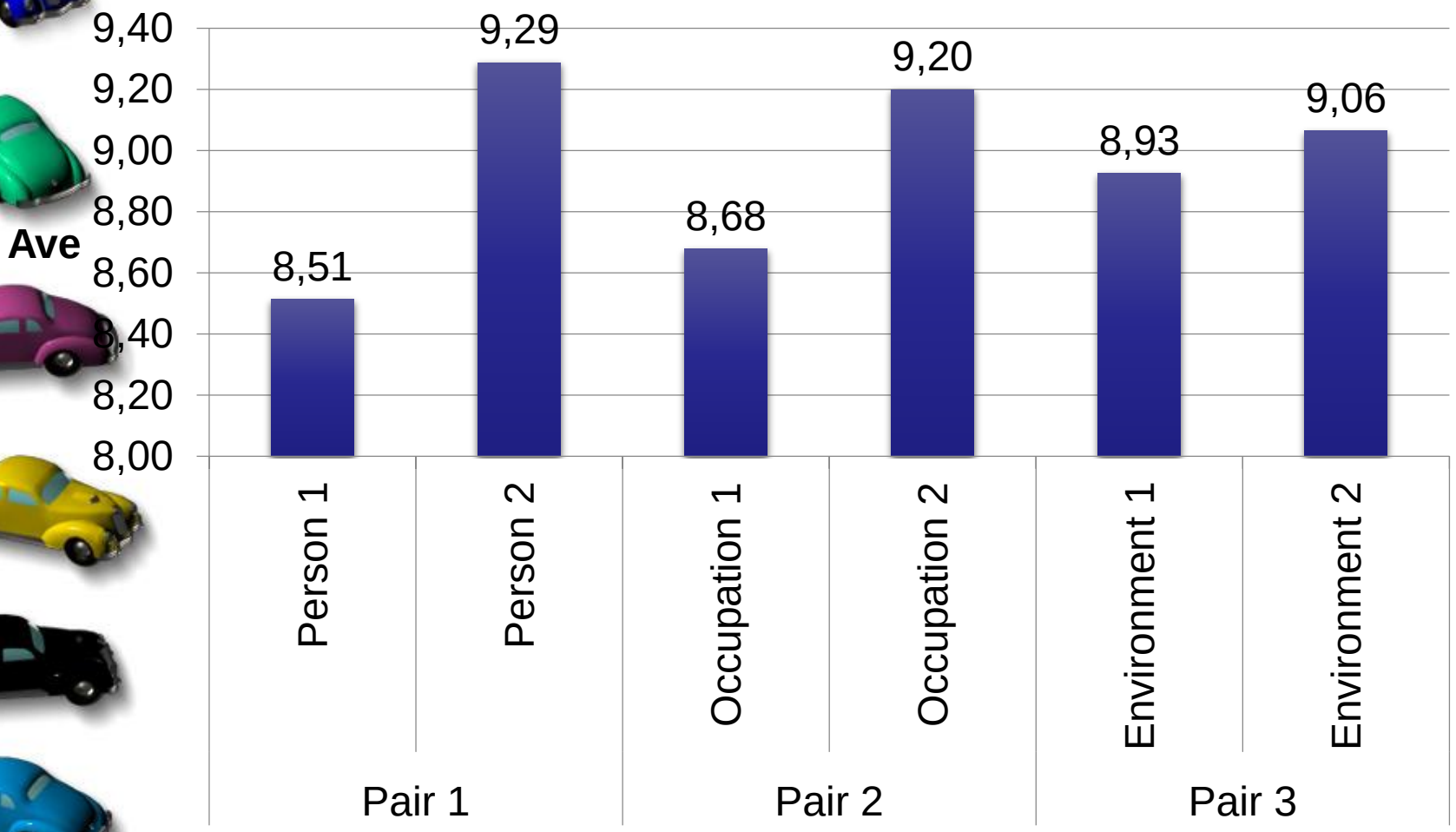
Differences in the number of accidents per year before and after the intervention



Subjective ratings of the level of performance



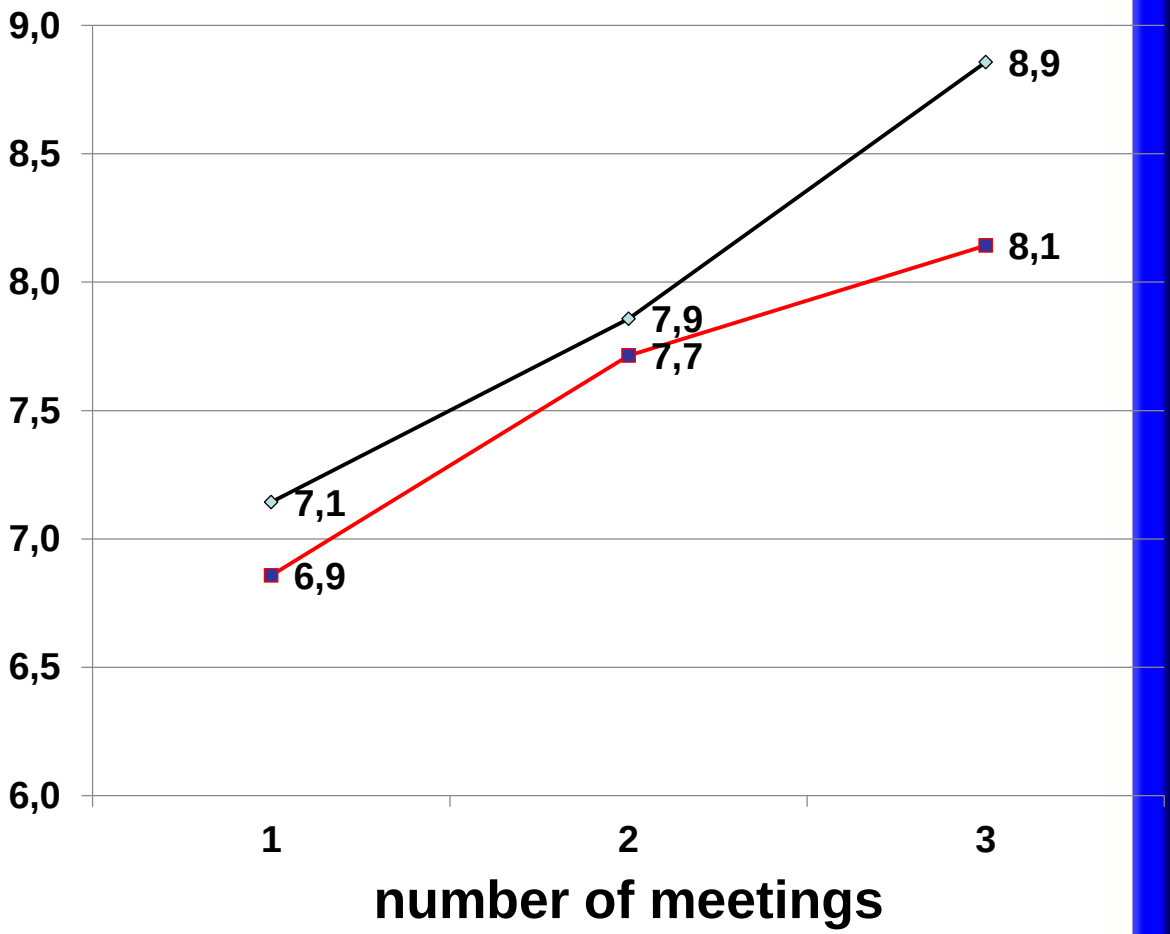
Subjective ratings of satisfaction with the level of performance



Dealing with distractions while driving (N=7)

level of performance

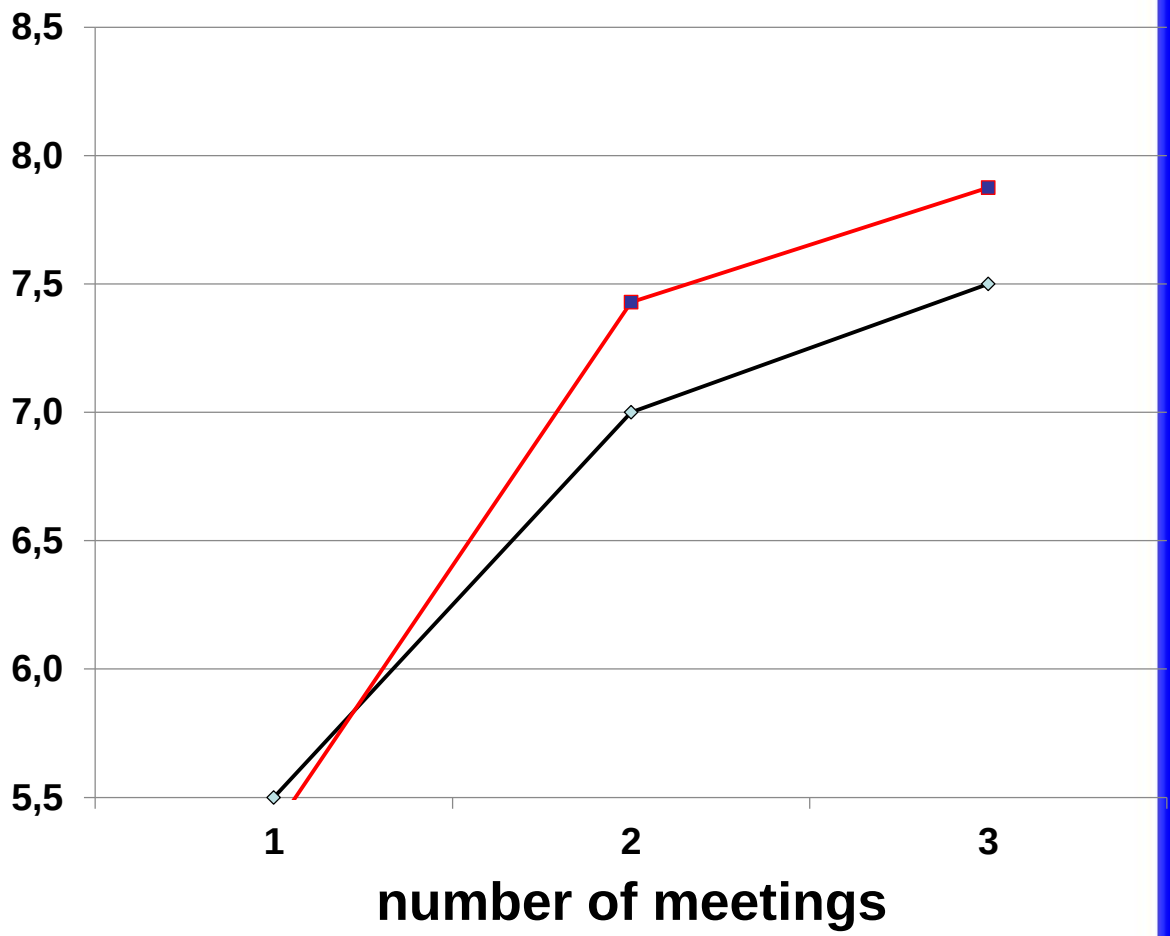
satisfaction from level of performance



Relationship with the passengers (N=8)

level of performance

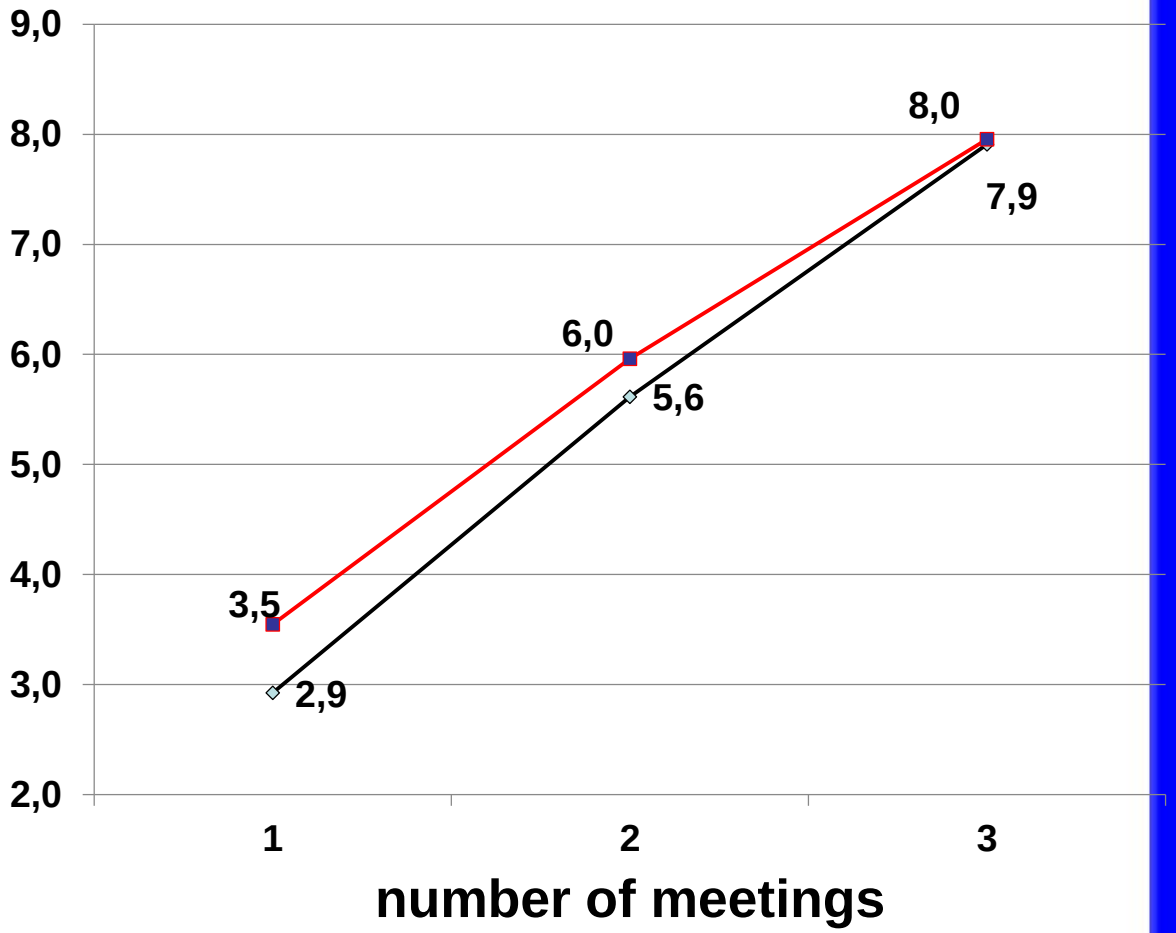
satisfaction from level of performance

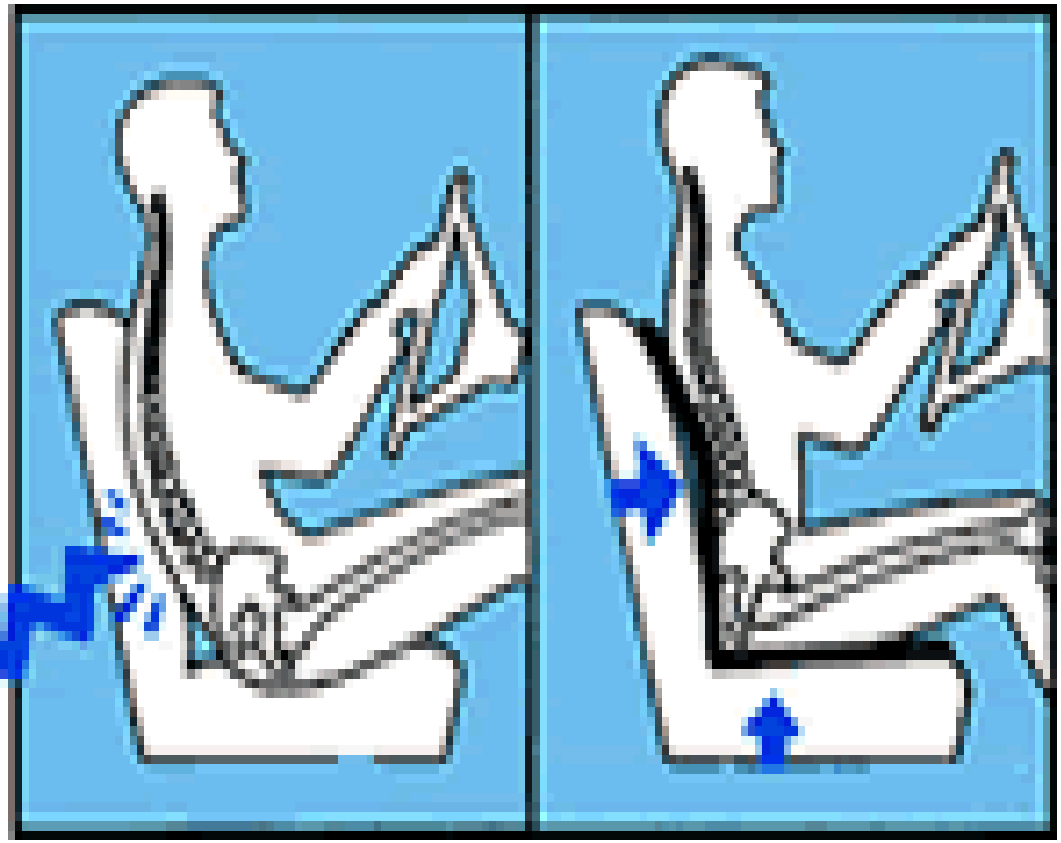


Ergonomic Intervention (N=13)

level of performance

satisfaction from level of performance






תנועה
איכות האויר
מזג אויר
ישיבה
שדה ראיה
תקיפה
תאורה
רעש
מיגון נגד התנגשות
רעידות
עיבוד מידע

Conclusions

- Improved objective and subjective measures
- Potential contribution of occupational therapists to prevent car accidents
- Improving the well-being of drivers.

- Enables familiarity with advanced technologies
- Enriches the knowledge in regards to using a wide variety of driving assessment tools
- Making the best practice decisions.

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THANK YOU