



How environmental features in urban areas affect the perceived risk of child pedestrians

Hagai Tapiro*, Yisrael Parmet & Tal Oron-Gilad

Presentation at the HFES-EU conference
2014 Lisbon, Portugal

*Corresponding author- tapiroh@post.bgu.ac.il

Introduction

Crossing the road is a complex task that involves perception, cognitive skills and motor abilities. In order to decide whether to cross the road or not, one is first required to judge whether the crossing place is 'safe' or 'dangerous'; this decision is based upon experience, current situation and the anticipated conditions. The way pedestrians perceive a place as suitable for crossing may affect their awareness toward potential hazards and will affect the overall readiness and situation awareness. The aim of this work was to study the road-side factors that influence the way children evaluate the road as safe or dangerous for crossing.



Method

24 elementary school children (ages 7-8, 9-10, 11-13) and 12 adult university students viewed 41 stills of real-world road-side scenes on a wide screen, and were asked to rate each scene for safety of crossing as fast as possible using a slide bar (0-100). Each scenario was classified by the general area it was located in (residential, commercial, industrial, indefinite), crossing location, proximity to road features (e.g., junction, road circle), type of road, number of lanes, and number of distractors (conspicuous elements in the environment). No driving vehicles were present in the scenes.

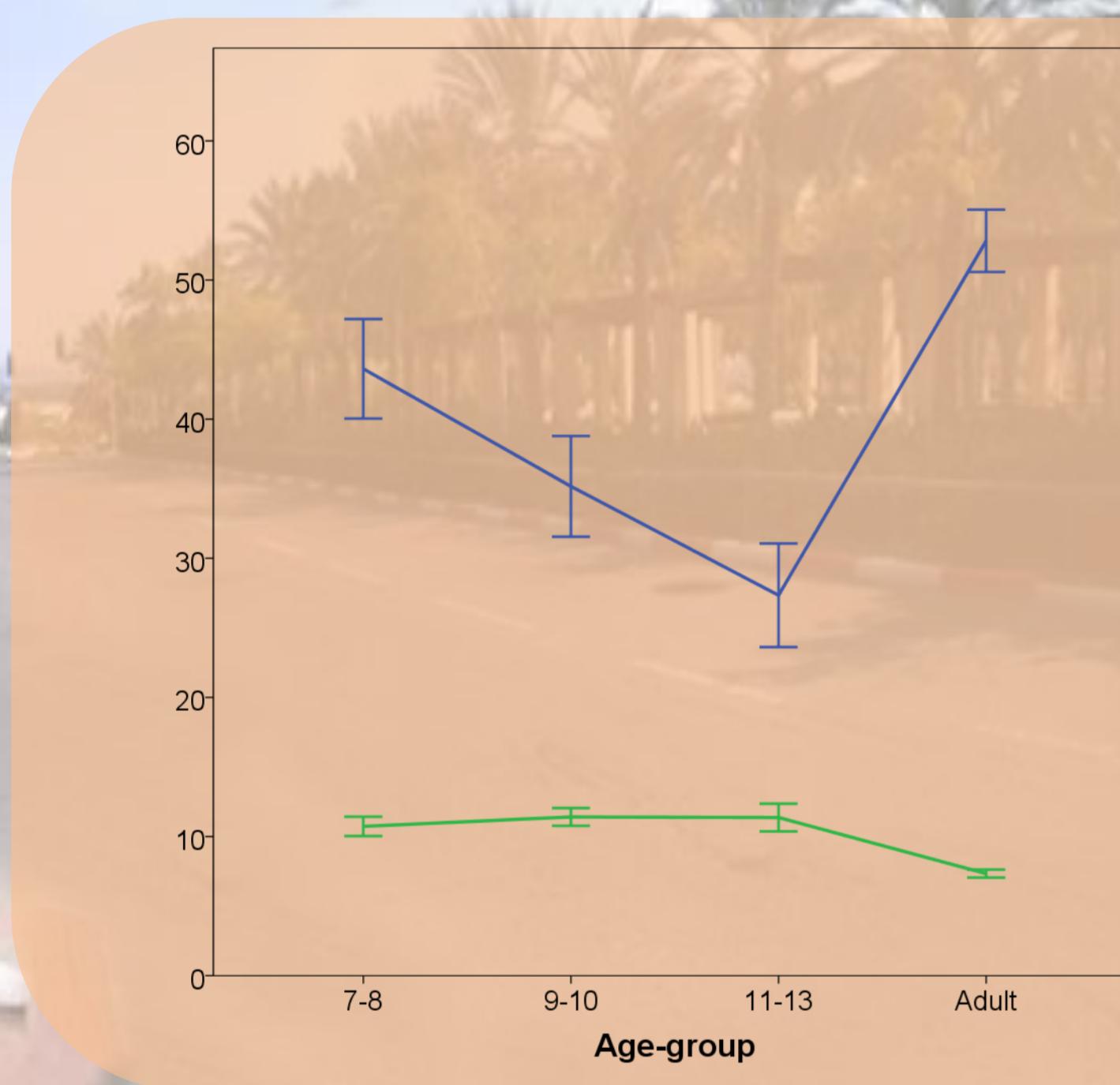


Fig. 1. The Blue bar indicates the overall safety rate in all scenes and the green bar indicates the average crossing decision time by each age group.

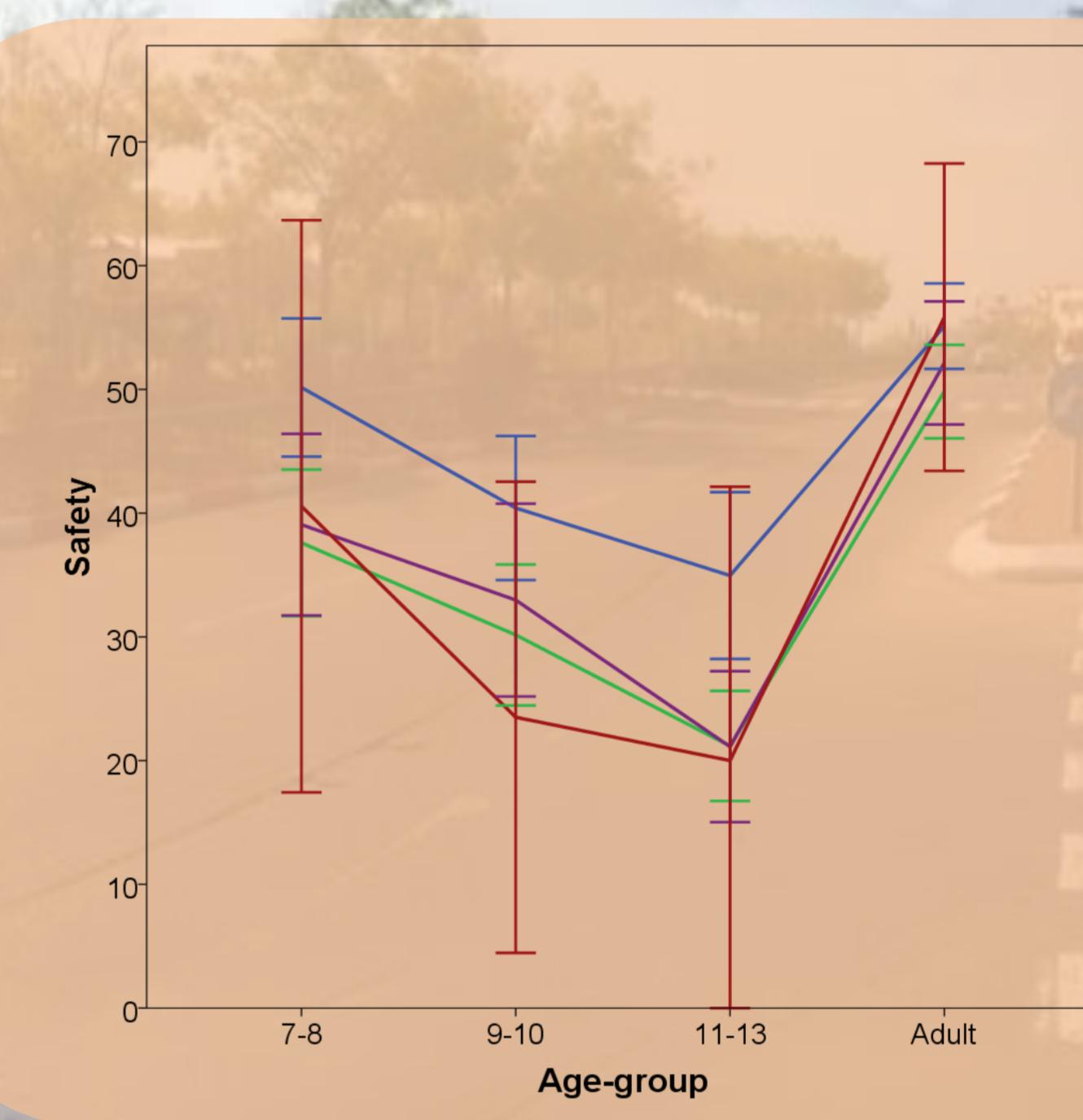


Fig. 2. The average safety rate by each age group in relate to the area where the crossing site is located.

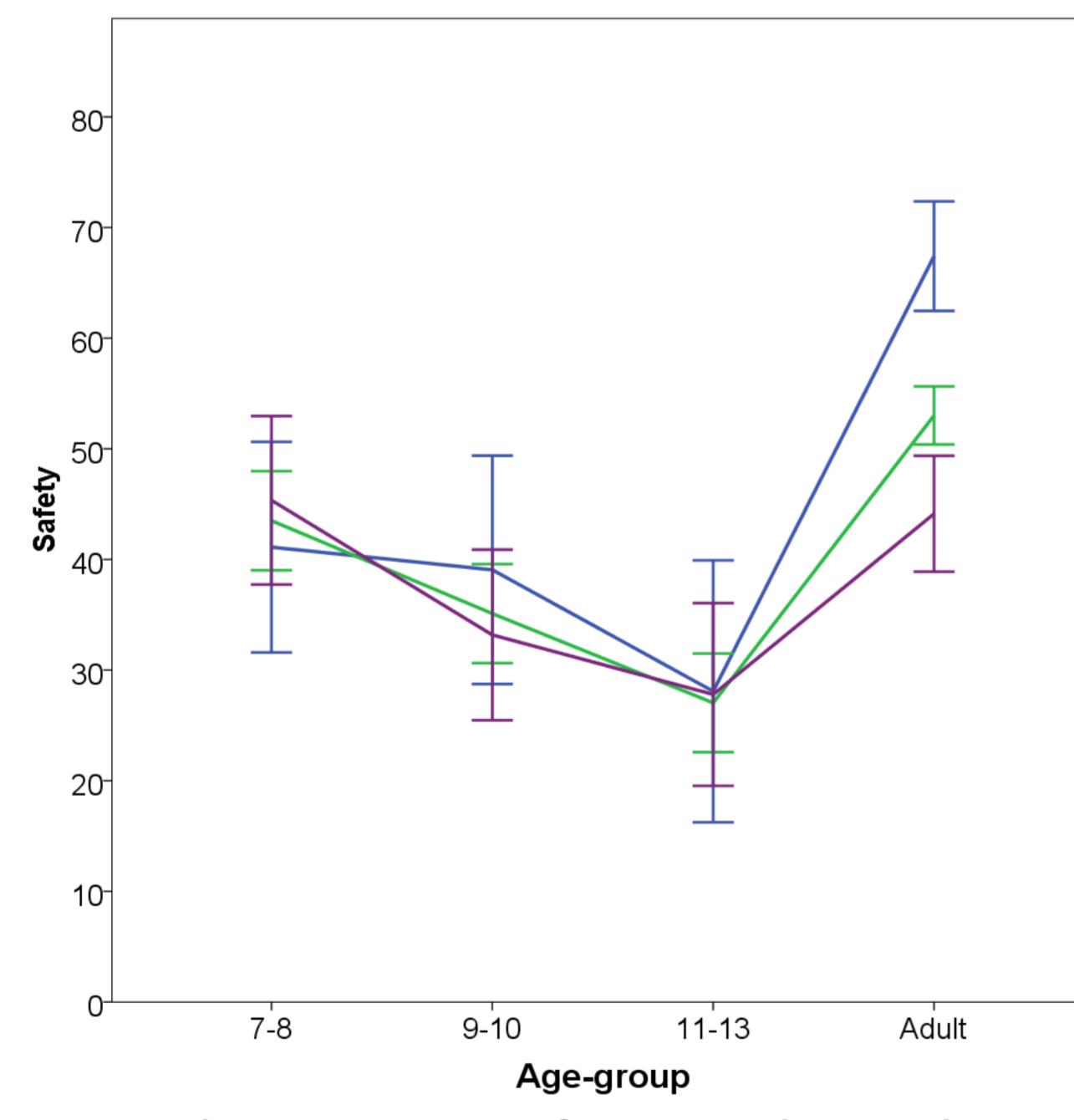


Fig. 3. The average safety rate by each age group in relate to the number of lanes in the road.

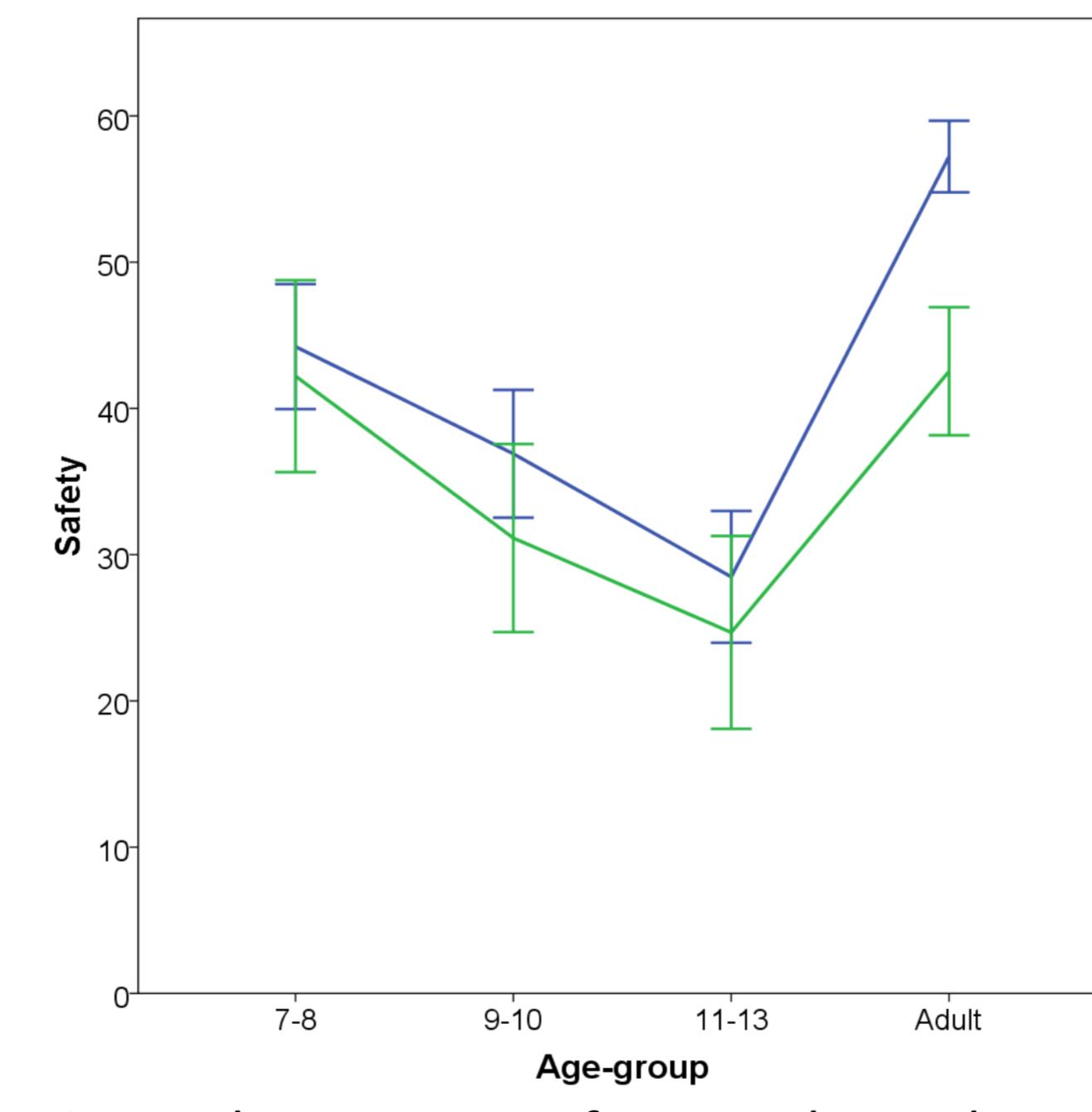


Fig. 4. The average safety rate by each age group in relate to the driving speed in the road.

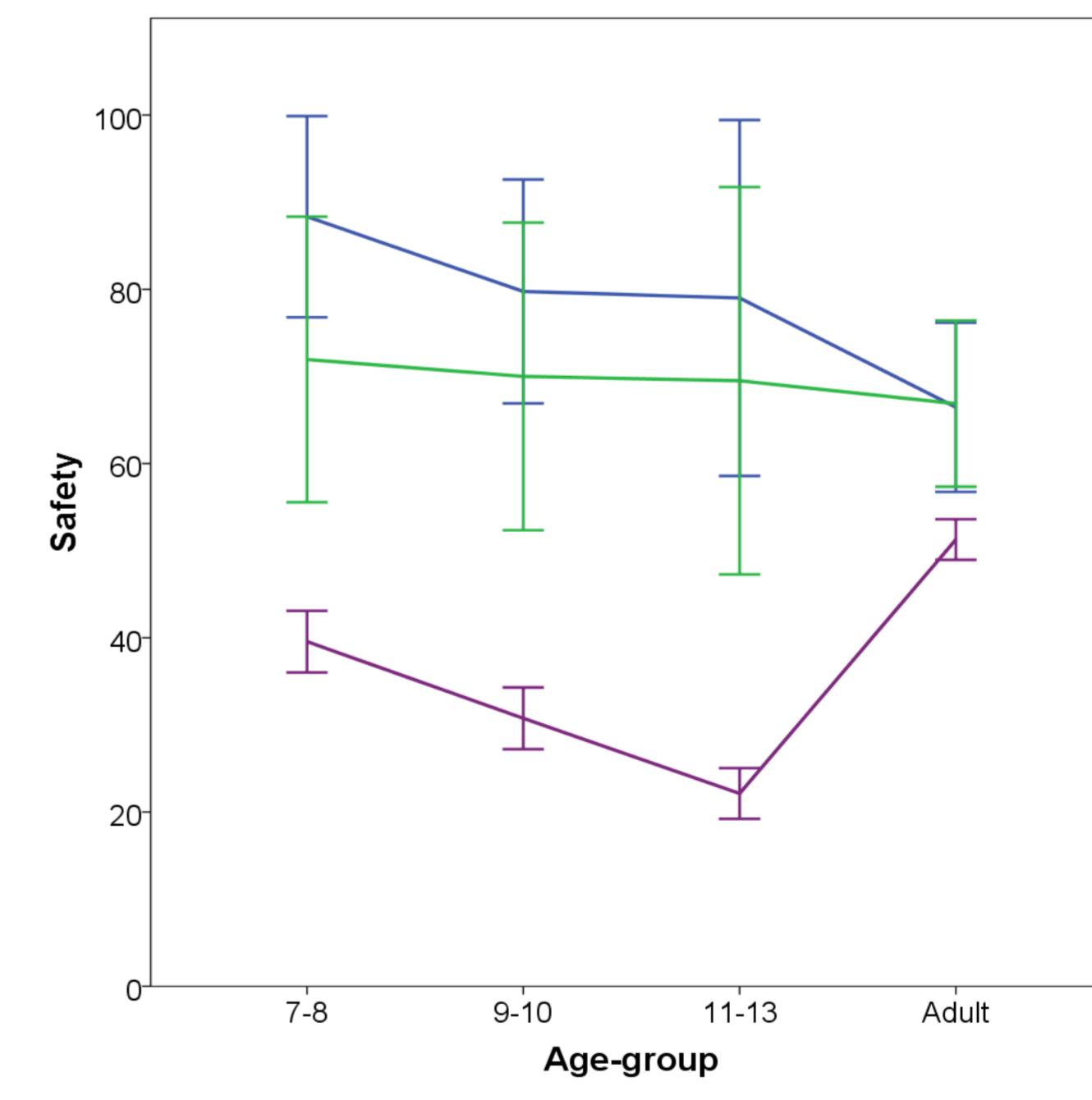


Fig. 5. The average safety rate by each age group in relate to the crossing location.

Results and Discussion

Children evaluate the safety of a place for crossing using more "obvious" factors in the environment that are "prone" pedestrians, like dedicated crossing locations. It seems that children look for certain reassurance for crossing and ignore or are blind to other significant properties of the environment in consistent with previous findings (Meir et al., 2013). In contrast, adults seem to base their decision more on higher order reasoning (e.g. time of exposure to danger derived from the number of lanes), which implies upon more sophisticated decision making process that improves with age/experience. The results also show that children are less secure in general when coming to cross the road and that it takes them longer to reach a decision. When the decision is made it is more diverse. Adults' fast decision can imply that they rely more on past experience and acquired knowledge, while children's varied answers may suggest that they are still making "new" decisions and that each of them perceives the scene in a different manner, even within the same age group.

References

Meir, A., Parmet, Y., & Oron-Gilad, T. (2013). Towards understanding child-pedestrians' hazard perception abilities in a mixed reality dynamic environment. *Transportation Research Part F: Traffic Psychology and Behaviour*, 20, 90-107.