

Addiction to Automation: The impact of the flight directors on pilots' visual behavior

Automation has a strong influence on human behavior. In aviation, poor manual flying skills still represent a contributing factor in several accidents and incidents. In daily operations, most approaches are flown with the use of automation (e.g., flight directors). Little research has investigated yet how use of the flight directors can affect pilots' skills. We studied how the flight director influences pilot performance using a full-flight simulator. We had twenty airline pilots equipped with portable eye-trackers perform two ILS CAT 1 approaches under standard IFR weather conditions (flight directors on vs. off). At a behavioral level, the flight directors significantly improved the precision of the approach, leading to less flight path deviations and fewer sidestick inputs. At an eye-tracking level, the flight directors significantly impacted pilots' fixations, with more fixations on the central part of the Primary Flight Display (flight director position), fewer fixations on the outside world, the localizer, the glideslope and the altitude. The results suggest that the flight directors shift how pilots perform manual approaches. In a long-term perspective, we emphasize the importance of training and line practice with the flight directors disengaged - when conditions permit - in order to maintain basic skills and self-trust.