# Driving and Risk Taking

Racing games are different from other games driving is a big part of the day-to-day life. Driving is a safety critical task. According to the U.S. Census Bureau \citep{USCensus2015}, 86\% of all workers commuted to work by private vehicle. Given the amount of time spend with driving, it`s important to consider all the risks. Section~\ref{personality} analysed gamer personalities and revealed a clear correlation between the Sensation Seeking personality trait and risk taking. Driving is a safety critical task and taking risks can lead to accidents. This section discusses risk taking as part of driving. Taking the right amount of risks reduces driving errors and increases \textit{Performance}.

## Driver Safety

Traffic injuries have become a major health problem. To protect all road users we need to design safer vehicles, roads and infrastructure \citep{WHO2009}. Great efforts have already been made to improve vehicles and safety equipment. Crash analysis data shows a reduction of traffic accidents in recent years \citep{StatisticsAustria2016}. Driving assistance systems focus on the major causes of crashes. Unintentional lane departure is responsible for about 40\% of crashes in Europe. \textcite{Navarro2011} showed that Lateral Control Assistance reduces the number of loss of control accidents by 25\%. Advanced driver assistance systems reduce the risks and improve the driving experience. They are a vital part of modern cars, motorcycles and trucks. \textcite{GermanInsurers2016} found that the theoretical safety potential ranges from 2\% for simple blind spot detection systems up to 45\% for Emergency Break Assistance Systems. The advanced driver assistance system is a fast growing sector. The market is expected to reach USD 67.43 billion by 2025 \citep{GrandViewResearch2018}. In order to realise an intelligent transportation system researchers focus on inter-vehicle communication and smart roads \citep{Nadeem2004}. Trending research questions are safe driving, dynamic route scheduling, emergency message dissemination and traffic condition monitoring.

## Risk Groups and Driver Education

Despite all efforts in assistance systems, statistics indicate two high-risk groups in young, inexperienced drivers and elderly drivers above 65 years. Young drivers have only a little experience in complicated situations. \textcite{Clarke2005} found that young drivers have a tendency to take higher risks. Driving is a fun and exciting way of testing limits. It is important that young drivers are confronted with high-risk situations in a safe way. \textcite{Tada2014} investigated elderly driver behaviour. They demonstrated a lack of scanning behaviour to identify possible threads. Safe driving skill can be identified by the drivers head motion and pedal operation. It`s important to provide personal training programs based on the shortcomings of a driver. \textcite{Fischer2007} showed that playing violence encouraging racing games increases risk-taking behaviour in critical road traffic situations. Playing and watching reckless driver causes risk-related symptoms including blood pressure, risk-related cognitions and emotions \citep{Fischer2007}. The study found that nonviolent race games (e.g. F1\footcite{Formula1Game}, Gran Turismo Sport\footcite{GranTurismoSport}, Project Cars\footcite{ProjectCars}) arouse greater self-perception and a more positive driver attitude.

In this section we displayed that simulators are an effective tool for driver education. It’s important to identify risk groups and provide personalised learning approaches. Driving simulators have been found to improve driving experience, car control, self-perception and driving attitude. The next section discusses ways to improve the educational effects by increasing the Motivation in driving simulators.