Among the elderly, falling constitutes a major health problem in terms of both incidence and consequences. To reduce the number of falls in old age, we need to understand the mechanisms underpinning a fall. Such insight can be used to identify individuals at risk of falling and to establish which interventions can prevent fall-prone individuals from falling. In this presentation, we will provide an overview of a series of experimental studies on tripping in the young and elderly adults addressing these objectives. Subjects were tripped repeatedly during walking in a self-selected while wearing a safety-harness. One of 21 obstacles that were hidden in the floor suddenly appeared at a predetermined instant of the swing phase. Experiments in young subjects showed that balance recovery after tripping over an obstacle, involves high demands on lower limb muscles. The support limb plays a crucial role in balance recovery by rapidly generating hip extension, knee flexion, and ankle plantar flexion moments during push-off. These joint moments reduce the forward rotation of the body and allow a rapid and forceful push-off, which provides space and time to place the other leg forward, while clearing the obstacle. Older individuals generated a similar pattern of joint moments, but did so at lower rates in all support limb joints and achieved a lower peak ankle moment than young adults. This appeared at least in part due to a lower rate of activation of the leg muscles as evidenced by EMG. The same mechanical parameters also appeared to differentiate older individuals that fell into the safety harness at least once during the experiments from those that successfully regained balance on 5 trials. Since muscular, tendinous and neural alterations associated with ageing cause strength to decline, leg muscle strength seems to be a limiting factor in preventing a fall. Indeed, high-risk fallers could be identified based on maximum leg press push-off force capacity. Resistance training can reverse the age-related loss of strength. Therefore, we performed a feasibility study on the effects of 16-weeks resistance training on tripping reactions in a small group of elderly. Four healthy older adults were assigned to resistance exercise training program of 16 weeks, and 5 older adults served as non-exercising controls. The training program consisted of knee extension, leg press and calf raise resistance exercises at 80% of the 3 Repetition Maximum and additional exercises aimed at improving the rate of moment generation of the plantar flexors. Two exercise sessions were performed each week for a period of 16 weeks. Maximum leg press push-off force was increased significantly after training. Moreover, moment generation after tripping, especially around the ankle, improved more in subjects participating in the training program than in controls. It was concluded that transfer of resistance training effects to balance recovery after a perturbation of gait is feasible.