# DFG research grant (FI 1624/2-1) 2010-2014, "The Functionality of Alerting Signals in Action Control"

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Alerting warning signals are meant to optimize behavior in complex and error prone human-machine interactions and are thus often found in vehicles as "Lane Departure Warning Systems", "Vehicle Headway Sensors", or "Reverse Parking Sensors". In recent research, however, we could show that alerting signals are especially beneficial in the initiation of reflexive response tendencies, which results in increased response conflicts when two response alternatives compete for control of action. Such increased interference effects have been explained by alerting signals impairing executive control or widening the scope of visual attention. In contrast, we interpret this finding as an alerting signal based enhanced memory retrieval process on the basis of acquired stimulus-response (S-R) links. In recent studies we could show that the alerting-increased interference effects critically depend on the existence of S-R links and that alerting signals reduced neural activity in primary visual cortex. We assume that alerting signals trigger a shift in cognitive control engagement to a stronger reliance on habitual memory-based reflex-behavior that may be accompanied with an increase of efficiency in information transmission from lower to higher cortices.