

## Abstract

A prototypical conceptualization of *implicit learning* appears to be: "incidental learning which results in unconscious knowledge." Its existence is hotly debated, especially in the domain most widely used for research on it, i.e., sequence learning. This dissertation reports new evidence for implicit sequence learning.

In four experiments, subjects were first trained on a serial reaction time task with a repeating sequence; second, they were given a recognition task in which fragments of the trained sequence had to be discriminated from distractors. Fragments either required no motor responses to the fragment's elements (*visual recognition task*), or were presented without visual-spatial information (*motor recognition task*). Critically, the motor recognition task allowed to concurrently measure sequence knowledge expressed through RTs (i.e., faster responses to trained than distractor fragments' elements; *RT knowledge*), and knowledge expressed through conscious recognition judgements (*judgement knowledge*). There were two further manipulations: (a) subjects were trained on one of two sequences differing in surface structure only; (b) they were trained under incidental or intentional learning conditions.

The first main result was that the RT and judgement knowledge are partly independent even when measured in strictly comparable manners. This is shown by RT knowledge reacting differently to the manipulation of trained sequence than judgement knowledge. Apparently, some RT knowledge is not utilized for conscious recognition judgements. Thus, it appears unconscious. This is evidence for implicit learning.

Second, fragments were more likely to be judged as old when their elements were quickly responded to. Alternative explanations (e.g., Shanks & Perruchet, 2002) can be ruled out, leaving only the possibility that subjects based their judgements upon how fluent they processed a fragment. Such behavior apparently only makes sense if there is unconscious knowledge to be accessed in this way. This is evidence for implicit learning.

Third, it made no difference on the foregoing findings whether subjects learned incidentally or intentionally. Thus, whether learning is incidental or not does not seem to affect whether it is implicit. However, intentional learning always led to higher recognition in the visual than the motor recognition task; incidental learning did not. Thus, whether learning is incidental or not appears to affect the modality specificity of learning.

In summary, it seems that implicit sequence learning does exist in that learning does result in unconscious knowledge. However, it appears better to conceptualize implicit learning without defining whether it is incidental or intentional learning.