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How implicit is statistical learning?

Phillip Hamrick and Patrick Rebuschat

Introduction

How learners extract knowledge from the environment is one of the fundamental questions in cognitive science. In this chapter, we will focus on two approaches that have gained in prominence over the past 15–20 years, namely *implicit learning* and *statistical learning* (see also Dienes, this volume; Misyak, Goldstein, & Christiansen, this volume). Implicit learning research began with Reber's (1967) early work and developed into one of the major paradigms in cognitive psychology (see Perruchet, 2008, for an overview). Statistical learning research was sparked by the work of Saffran and colleagues (Saffran, Aslin, & Newport, 1996) and now represents an important research strand in developmental psychology (see Gómez, 2007, for an overview).

Both approaches focus on how we acquire information from the environment and both rely heavily on the use of artificial grammars. In typical experiments, subjects are first exposed to stimuli generated by an artificial system and then tested to determine what they have learned. Given these and other similarities, Perruchet & Pacton (2006) suggested that implicit and statistical learning represent two approaches to a single phenomenon. Conway & Christiansen (2006) go as far as combining the two in name: *implicit statistical learning*.

Despite the considerable overlap between implicit and statistical learning research, there are several important differences. For example, one of the most distinctive features of statistical learning research is the careful manipulation of statistical information in the input. This aspect is generally absent in implicit learning studies. In addition, statistical learning research generally concentrates on how we acquire linguistic information, while implicit learning research focuses on information in general.¹ For this reason, statistical learning researchers tend to employ artificial systems that resemble

1. As one of our reviewers pointed out, there are also several studies on statistical learning in different modalities and with non-linguistic stimuli.

