

# Changing expectations: does retrospection influence our perceptions of melodic fit?

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## ABSTRACT

### Background

Statistical models can predict listeners' melodic expectations (Pearce & Wiggins, 2006), and probable musical events are more readily processed than less probable events (e.g. Marmel, Tillmann, & Delbé, 2010). However, there has been little consideration of how such expectations might change through time, as remembering becomes necessary (Margulis, 2007). Huron's ITPRA theory (Huron, 2006) proposes successive stages forming musical expectation, the last of which, appraisal, might shift a listener's representations and expectations. The temporal trajectory of expectations and the role of remembering and appraisal, are not well understood.

### Aims

The aim of this experiment was to identify conditions in which expectation and retrospective appraisal contribute in melodic processing. It was hypothesized that melodic expectations based on the most recently heard musical sequence would initially influence ratings in a probe tone task, with a shift to a retrospective analysis of the whole sequence through time.

### Method

Four male and 12 female 'non-musicians' studying undergraduate psychology (mean age 20.5 years, range 17 to 37) participated for course credit. An adaptation of Krumhansl's probe tone method (Krumhansl & Kessler, 1982) was used, in which an isochronous melody was presented, consisting of a sequence of five chords in one key (e.g. G major) followed by a sequence of three monophonic notes forming an arpeggio in another key a semitone away (e.g. F# major). Following this, a probe tone was presented immediately, 1.8s, 6s, or 19.2s later. Participants hearing the stimuli over headphones rapidly rated the goodness of fit of the probe to the preceding context, using a 7-point scale. The tonal relationship of the probe to both parts of the melodic sequence was manipulated.

### Results

Probe tone ratings changed significantly with time. Response variability decreased as the time to probe presentation increased, yet ratings at every time point were significantly different from the scale mid-point of '4', arguing against increasingly 'noisy' data, or a memory loss, even 19.2s after presentation of the melodic sequence. Suggestive evidence for a role of appraisal was the development with delay time of statistical correlation between distributions of perceived fit and predictions based on literature data on tonal pitch preference, or on the IDyOM model of statistical probability (Pearce & Wiggins, 2006).

### Conclusions

With no further musical input, listeners can continue to transform recent musical information and so change their expectations beyond simply forgetting.

### Keywords

Expectation, retrospection, memory, probe tone, musical probability

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