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Key Profiles as Pitch Salience Profiles of Final Triads in Renaissance Music

The question of the nature and origins of major-minor tonality is still not satisfactorily resolved, despite the significant recent contribution of empirical psychology and psychoacoustics. A possible reason is that these studies have failed to adequately address the historical evolution of tonal-harmonic syntax, and associated changes in perception (R. Eberlein, 1994). While the perception of past generations cannot, of course, be directly investigated, one may still reasonably speculate about the evolution of music perception on the basis of known historical changes in the statistical properties of music.

A historical precursor of major-minor tonality was the emergence of major and minor triads as compositional elements during the 13th-15th Centuries. By the 15th Century, the sound (timbre and chroma salience profile) of these sonorities was familiar to European ears. During the late 15th, 16th, and early 17th Centuries, major and minor triads gradually replaced open-fifth sonorities as final chords.

On this basis one might reasonably hypothesize that the sense of closure produced by an isolated tone at the end of a passage of major-minor music (as in the probe-tone paradigm) depends on the degree to which it represents the tonic triad just as the root of a chord may be regarded as the single tone that best represents it. That would explain the high correlation (major:  $r = 0.94$ ; minor:  $r = 0.95$ ) between key profiles of C. L. Krumhansl and E. J. Kessler (1982) and the chroma salience distribution (after R. Parncutt, 1988) of the corresponding tonic triads. Another promising model of the key profiles (which could, on closer inspection, be based on similar assumptions) is Lerdahl's (1988, p.

321) five-level tonal pitch space. A more complex model, such as that proposed by Parncutt (1989), seems unnecessary.

The key profiles also correlate strongly with tone distributions (chroma prevalence distributions) in major-minor music (Krumhansl, 1990). A possible music-theoretic explanation, extending the implication-realization concept of L. B. Meyer and E. Narmour, is that the chroma prevalence distribution creates an implication that is realized by the tonic triad. In other words, the tonic triad in some sense encapsulates the entire prevalence distribution in a single sonority.

Taken together, these perceptual, cognitive, historical and music-theoretic observations may be regarded as convergent evidence that both key profiles and chroma prevalence profiles arose historically from the chroma salience profiles of tonic triads.