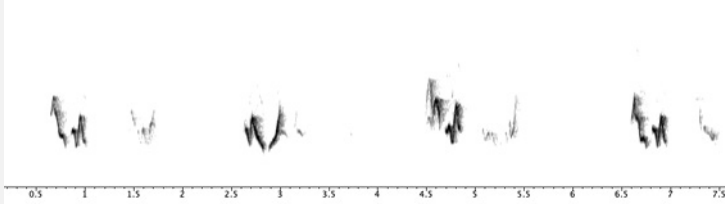


Distinguishing Philadelphia Vireo and Red-eyed Vireo by song

The challenge: Songs of these two species are nearly identical, and most previously-described differences are subjective and overlapping. Identification by sound depends on esoteric details, and should be confirmed by sight..

Philadelphia Vireo typical song

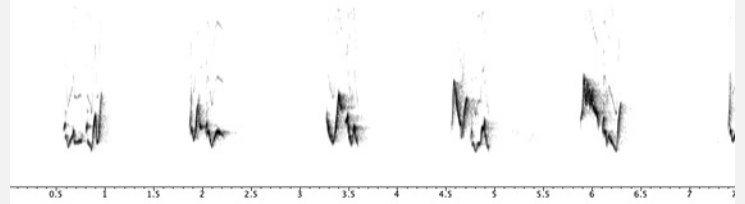


Recorded by Bob McGuire in Maine

Listen for:

- tiny “full stop” gaps within many phrases, very difficult to detect by ear but can sound choppy like *twiddle-teep*
- phrases less varied, e.g. *twiddle-teep*, *cheep-fidleep*, *fid-dle-pip*, ..., and smaller repertoire with frequent reuse of phrases, eg. ABCBAC...
- many phrases have rising ending, show a broad U shape in spectrogram, and fit a phonetic rendering like *twiddle-teep*

Red-eyed Vireo typical song



Recorded by Lang Elliott in New York

Listen for:

- few real temporal gaps within phrases, very difficult to detect by ear but can sound more hurried, like *twiddleleep*
- phrases more varied, e.g. *chidilep*, *pitti-pitti*, *tiree-didip*, ..., and larger repertoire with long strings of different phrases and little reuse, eg. ABCDEF...
- many phrases have lower ending, not showing a U shape in spectrogram, and fit a phonetic rendering like *chidilep*

Overview

The overall singing performance in both of these species is a series of short musical phrases separated by short pauses: *cheerio*, *cheerup*, *cheedeep*, *chipreet*,... The song of Philadelphia Vireo is sometimes described as sounding weaker, higher, choppier, more repetitive, or otherwise a little different, but these are vague and subjective impressions and can be matched by Red-eyed Vireo. The traditional “field marks” of sounds—like pitch, quality, tempo, accented syllables, etc—are not very useful in these species, and the variation within each species (mostly in Red-eyed) overshadows the differences between them. It is true that any individual Philadelphia Vireo will sound a little different from any Red-eyed Vireos around it, but many vireos that “sound different” will turn out to be Red-eyed.

Actual differences

Philadelphia Vireo tends to sing phrases with *twiddle-eeep* pattern, and few of the phrases in their repertoire stray far from that pattern (usually). They have a smaller repertoire of phrases, and the phrases are less varied, than in Red-eyed. Similar phrases are common in Red-eyed Vireo but typically make up a minority of their repertoire, and a singing performance will usually include a wider variety of phrases. Spectrograms show small gaps within many phrases of Philadelphia Vireo, and a more continuous trace for each phrase of Red-eyed.

A bird singing varied phrases, including short, sharp, doubled phrases and many downslurred phrases is probably a **Red-eyed Vireo**. Even more so if a spectrogram shows no gaps within phrases.

A bird that consistently sings *twiddle-teep* phrases with little variety and with small gaps within phrases is a good candidate for **Philadelphia Vireo** and should be confirmed visually.

Individual variation in song

Both species are variable, and individuals seem to persist in a certain kind of variation, in both their overall repertoire and in the delivery of a series of song phrases, i.e. one Red-eyed Vireo can have a repertoire of song phrases that average higher and sharper than other individuals, and then string together five of its highest and sharpest variants in sequence. The beginning of a singing bout often consists of similar phrases repeated at longer than normal intervals (i.e. suggesting Philadelphia). Some of this will average out in longer listening, but some individuals always sound different. Two individual Red-eyed Vireos often sound more different from each other than either does from Philadelphia.

Vocal Copying

One hypothesis for the similarity of these two species’ songs is that Philadelphia Vireo has evolved to sound confusingly like its larger relative, allegedly benefitting by defending a territory against not just its own species but also Red-eyed Vireo (Rice 1987, *Animal Behaviour* 26:527-549). I am skeptical of this, and the lack of variety in Philadelphia Vireo song phrases strongly suggests that they are *not* copying Red-eyed Vireos.

On the other hand it is clear that Red-eyed Vireo copies sounds from its environment and incorporates them as song phrases. Copies of short (mainly two-syllabled) sounds of Yellow-bellied Flycatcher, Eastern Wood-Pewee, Broad-winged Hawk, Barn Swallow, American Goldfinch, and others are all documented (DAS audio recordings). This suggests that Red-eyed Vireos could incidentally copy phrases of Philadelphia Vireo if they are exposed to them, but we would never know because all of the phrases are so similar!