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Figuring Out Forensic Musicology

Stairway to Heaven, Taurus, and a Brief History of the Drooping Schema

ABSTRACT: In light of the growing prevalence of multimillion-dollar musical copyright infringement litigation, music theorists seem positioned to use their esoteric training for a decidedly practical purpose: as an informed presence within “forensic musicology,” the practice of evaluating “substantial similarities” (the legal term) between musical works. This article examines a recent example of such litigation, “Skidmore v. Zeppelin et al.,” involving the accusation that the opening of Led Zeppelin’s *Stairway to Heaven* (1971) is based on *Taurus* (1968) by the band Spirit. The “substantial similarity” in question involves the opening acoustic-guitar descents, a partial lamento bass figure sinking from tonic A down to F (the dominant E appearing in an upper voice), a version of rock’s “drooping” schema. After discussing relevant details of the case, I briefly outline some of the history of rock’s drooping figure across multiple prominent recordings in the years immediately before Led Zeppelin’s record. My aim is not to solve the issues of “Skidmore v. Zeppelin et al.” but rather to shed light on what the issues in fact are in this particular case, and what role music scholars have played in their determination. In the end, I advocate that music theorists make a concerted effort to involve themselves in forensic musicology, to the benefit not only of the lawsuits but also of the profession of music theory itself, an academic discipline historically isolated from even its closest musical siblings, let alone the general public.

Angesichts der zunehmenden Häufigkeit von Rechtsstreiten über musikalische Urheberrechtsverletzungen, bei denen es um Millionenbeträge geht, scheinen Musiktheoretiker*innen gute Voraussetzungen mitzubringen, ihre esoterische Ausbildung für einen ausgesprochen praktischen Zweck einsetzen zu können, nämlich in Form sachlicher Expertise innerhalb einer “forensischen Musikforschung”, die “grundlegende Ähnlichkeiten” (*substantial similarities*, so der juristische Terminus) zwischen musikalischen Werken einschätzt. Dieser Artikel befasst sich mit einem kürzlichen derartigen Fall, “Skidmore v. Zeppelin et al.,” der aus dem Vorwurf entstand, dass der Beginn von Led Zeppelins *Stairway to Heaven* (1971) auf jenem von *Taurus* (1968) der Band Spirit beruhe. Die “grundlegende Ähnlichkeit” hierbei umfasst die absteigende Harmoniefolge der eröffnenden akustischen Gitarre, ein Ausschnitt aus einer Lamentobassfigur von der Tonika A fallend bis zum F (die Dominante E erscheint in einer oberen Stimme), eine Variante des *Drooping*-Modells im Rock. Nach einer Diskussion relevanter Details des Rechtsstreits, stelle ich kurz einen Abschnitt aus der Geschichte der *Drooping*-Figur im Rock vor, als Querschnitt berühmter Aufnahmen in den Jahren unmittelbar vor Led Zeppelins Platte. Mein Ziel ist es dabei nicht, den Rechtsstreit “Skidmore v. Zeppelin et al.” zu lösen, sondern vielmehr die entscheidenden Aspekte dieses Falls zu erhellen und die Rolle, die Musikologen in ihrer Bestimmung eingenommen haben. Abschließend argumentiere ich dafür, dass Musik-

theoretiker*innen verstärkte Anstrengungen unternehmen sollten, um sich im Bereich der forensischen Musikforschung einzubringen, zum Wohle nicht nur der Gerichtsverfahren, sondern auch der Musiktheorie selbst, einer akademischen Disziplin, die in historischer Sicht selbst von ihren engsten Geschwisterfächern isoliert war, von der allgemeinen Öffentlichkeit gar nicht zu reden.

Schlagworte/Keywords: bass lines; Bassmodelle; copyright infringement; forensische Musikforschung; forensic musicology; Harmonik; harmony; Led Zeppelin; popular music; Populäre Musik; Urheberrechtsverletzung

Introduction

In light of the growing prevalence of multimillion-dollar musical copyright infringement litigation, music theorists seem positioned to use their esoteric training for a decidedly practical purpose: as an informed presence within “forensic musicology,” the practice of evaluating purported similarities between musical works. Unfortunately, the precise terms of this consequential activity are nowhere clearly defined and have received only occasional attention from the musicological disciplines.¹ This article attempts to navigate this gap by paying close attention to one recent case, “Skidmore v. Zeppelin et al.,” in the hope of casting light on the two songs’ relevant schematic background as well as on some more general considerations about the methods of forensic musicology. In the end, I advocate that music theorists make a concerted effort to keep abreast of, and involve themselves in, forensic musicology, to the benefit not only of the lawsuits, but also of the profession of music theory itself. (What follows is an academic article by a music scholar; I am not a lawyer, and my opinions on legal matters are those of a layperson.)

Just the Facts

On 31 May 2014, a legal complaint was filed against the surviving members of the British rock band Led Zeppelin concerning their famous 1971 song *Stairway to Heaven*. The colorful complaint (using some of the iconic font associated with Zeppelin) claimed copyright infringement and the “Falsification of Rock n’ Roll

1 Some exceptions aside – Reynolds 1992, Laroche 2011, Stewart 2014, Leo 2016, May 2016, Leo 2019 – music scholarship has barely acknowledged the existence of forensic musicology.

History.”² The suing plaintiff was Michael Skidmore, working on behalf of the Randy Craig Wolfe Trust.

Randy Wolfe, better known as Randy California, was the songwriter of *Taurus*, a track recorded in late 1967 and released in 1968 by the now mostly forgotten American band Spirit, of which Wolfe was a founding member. Stories about Zeppelin’s appropriation of the guitar part of *Taurus* had circulated for decades,³ and Wolfe had acknowledged the similarities, but was either not bothered enough or felt too intimidated (as his former band members have since claimed) to sue. Wolfe’s death in 1997 left a trust in its wake, and Michael Skidmore became its trustee in 2009. Skidmore brought the suit five years later.

As is typical in American copyright infringement lawsuits, the plaintiff faced three big legal hurdles. The first was proving ownership of the copyright. This was not a given in this case. Wolfe’s publishing contract with Hollenbeck Music suggested that *Taurus* had actually been written as “work made for hire,” a legal term that would mean the copyright holder was actually the publishing company, Hollenbeck, and not the songwriter. In that situation, Wolfe’s estate would have no standing to bring the suit in the first place (although it would possibly open up the potential for a different suit against Zeppelin brought by Hollenbeck).

The second hurdle was establishing access. The evidence here was circumstantial. Zeppelin had played a few of the same gigs as Spirit (at least three) in the late 1960s, two of these at festivals with many other rock acts, but the third being Zeppelin’s very first American performance on 26 December 1968, at which the British band was a last-minute opening addition to the billed opener Spirit and headliner Vanilla Fudge. However, no hard evidence or eye-witness accounts proving that the song *Taurus* specifically was played at any of these shows were presented by the prosecution. Later, during the jury trial, Zeppelin guitarist Jimmy Page admitted under oath that he owned a copy of the 1968 album on which *Taurus* appeared, but he said this was among tens of thousands of albums he

2 Skidmore v. Zeppelin et al. 2014, 1. This is but one of hundreds of distinct, public-record court documents available from various online sources; see especially <https://www.courtlistener.com/docket/4152899/michael-skidmore-v-led-zeppelin>. These documents serve as the principal factual sources for my article. See also the summary in Greene 2017.

3 See, for instance, Huxley 1995, 37.

owned, and he did not remember ever having heard the song. Zeppelin singer Robert Plant also denied ever having heard *Taurus* prior to 2015.⁴

The third hurdle was proving the two songs were “substantially similar.”⁵ Following precedent, a judge was to determine whether *Taurus* met an “extrinsic test,” proving that it and *Stairway to Heaven* feature an “objective similarity of expression.” Alternatively, the plaintiff could prove “striking similarity,” a higher standard that would eliminate the need to offer any evidence of access at all.

In April 2016, nearly two years after the initial complaint was filed, United States District Judge R. Gary Klausner filed a written order that rejected arguments by the defendants and sided with the plaintiff on all three issues.⁶ First, Wolfe’s trust was indeed the copyright holder of *Taurus* and thus had standing to sue. Second, Led Zeppelin did have access to the earlier song. And, third, and most pertinent to this discussion, the songs met the extrinsic test for substantial similarity (although not *striking* similarity). Among the defendants’ arguments, Judge Klausner was not swayed by the claim that Wolfe was not the copyright holder because of his work-made-for-hire status with the publisher Hollenbeck; the judge found credible the plaintiff’s evidence that the song *Taurus* had been written and performed in 1966 or early 1967, before Wolfe signed his contract with Hollenbeck, and since copyright ownership by law is automatically assigned at the moment of creation, regardless of when or whether one registers a copyright with the Library of Congress, Wolfe was indeed the copyright holder. (There is more to this story because of the issue of copyright renewal, but this is the gist of it.)

Another technical argument made by the defendants and rejected by Judge Klausner was laches, meaning that there was an unreasonable delay in bringing the copyright infringement lawsuit itself – 43 years after the initial release of *Stairway to Heaven*, well beyond the three-year retrospective statute of limitations. Judge Klausner rejected this argument based on the fact that *Stairway to Heaven* had been released in a remastered version in 2014, and “each infringing act starts a new limitations period.”⁷ So, the 2014 lawsuit indeed fell with the

4 Skidmore v. Zeppelin et al. 2016c, §5.

5 Skidmore v. Zeppelin et al. 2016d, Section VII.

6 Skidmore v. Zeppelin et al. 2016d.

7 Ibid., Section V, B.

stated three-year period. I have to assume this is the reason that Skidmore waited 17 years after Wolfe's death (2 January 1997) to bring the suit.

Having ruled in favor of proceeding to trial, Judge Klausner convened a jury, so that the next step in determining substantial similarity, the 'intrinsic test', could be performed. This is how the U.S. Ninth Circuit (where the case was tried) works: the judge can determine whether the initial, objective, "extrinsic" test has been met, and if the works pass that measure of substantial similarity, then a jury is needed to perform the ensuing "intrinsic test," which is the "subjective assessment" of the "concept and feel" of the two works.⁸ That intrinsic test, among other technicalities, also needs to be passed in order for the final verdict to favor the suing plaintiff.

In June 2016, after six days of trial, the jury ruled in favor of the defendants, Led Zeppelin. The jury did not even make it to the intrinsic test, the subjective assessment. The jury did not agree with the judge's earlier decision that the songs passed even the extrinsic test. The whole process stopped at that point. A drawn-out appeal was likewise decided in favor of Led Zeppelin on 9 March 2020.

Forensic Musicology

Why was the court's objective measure of substantial similarity, the extrinsic test, decided one way by the judge and later the other way by the jury? There's no easy answer to this question. Public court documents do not include a jury's rationale, merely its overall votes. Yet it is clear in Judge Klausner's earlier written order, and I would guess also in the jury's unwritten decision, that the deciding factors lay primarily in the information provided by the competing musical experts. The plaintiff offered written reports by three musical experts: Alexander Stewart, PhD (Professor at the University of Vermont), Erik Johnson (Adjunct Faculty at the University of the Arts in Philadelphia), and Brian Bricklin (producer/engineer). The defendants submitted written reports by two musical experts: Lawrence Ferrara, PhD (Professor at New York University) and Rob Mathes (arranger/producer). These reports, examples of "forensic musicology," comprise evaluations of the alleged resemblances, written with the goal of distinguishing original, schematic, and appropriated features, and communicating these findings

8 Ibid., Section VII, C, 2.

to lay parties in a formal setting. In the American adversarial judicial system, experts are retained by the plaintiff and defendant, so it is expected that there will be contradictory expert reports.⁹ Judge Klausner's written order makes substantial reference to the reports by these experts. When the jury was convened, some of these experts additionally testified in court, and their testimony undoubtedly weighed heavily on the jury. Unfortunately, I have not secured a recording or transcript of this testimony; I have only obtained bits and pieces conveyed through an assortment of disparate secondary sources. I do, however, possess some of the material from the written expert reports, and what I have read regarding the in-person testimony is aligned with those written documents.

Before getting into some of the details of these written reports, I must address the judge's limits on the musical features under consideration for determining substantial similarity in this case. Klausner ruled that the copyright for *Taurus* applied only to the sheet music originally deposited in 1968 at the Library of Congress, because he determined that the song's copyright was governed by the law in effect at the time of its creation. That law was the American copyright act of 1909. Sound recordings were not protected under American copyright law until 1972.

A major consequence of this evidentiary ruling is that questions of similarity could not take into account "unprotected performance elements."¹⁰ This includes anything and everything that was not actually written down on that original transcription, precluding consideration of even basic tempo and instrumentation in this case. Hence, the correlations in the production techniques, the shared celestial titular imagery, the parallel roles of Led Zeppelin's recorders and Spirit's harpsichord, even the central role of the acoustic guitar itself were all ruled inadmissible. The jury was never played the full recording of *Taurus*; rather, excerpts of the *Taurus* sheet music were apparently played from recordings made for the trial or performed live in the courtroom using an acoustic guitar or electric piano. Full recordings of *Stairway of Heaven* were played for the jury, as well as home demos presenting the song at various stages in its development. The inability of the plaintiff to attempt to show substantial similarity between *Stair-*

9 A similarly partisan take on the purported similarities in this case can be found in an unsolicited amici curiae brief of fourteen music professors siding with Zeppelin. See *Skidmore v. Zeppelin et al.* 2019.

10 *Skidmore v. Zeppelin et al.* 2016d, Section VII, C, 1.

way of *Heaven* and full recordings of *Taurus* – studio or live – was the centerpiece of the plaintiff’s appeal. Judge Klausner wrote:

Once all the unprotected performance elements are stripped away, the only remaining similarity is the core, repeated A-minor descending chromatic bass line structure [...] lasting 13 seconds and separated by a bridge of either seven or eight measures. Moreover, the similarity appears in the first two minutes of each song, arguably the most recognizable and important segments of the respective works. Finally, [quoting Stewart’s expert report,] “[n]early [sic] 80% of the pitches of the first eighteen notes match, along with their rhythms and metric placement. The harmonic setting of these ‘A’ sections feature [sic] the same chords during the first three measures and an unusual variation on the traditional chromatic descending bass line in the fourth measure.”

Defendants argue that the descending chromatic bass line is a centuries-old, common musical element not entitled to protection, and, therefore, Plaintiff has failed to satisfy the extrinsic test. The Court [i.e., the judge] disagrees. While it is true that a descending chromatic four-chord progression is a common convention that abounds in the music industry, the similarities here transcend this core structure.¹¹

The wording here is a little confusing, because the judge uses the term “core” in two different ways, once as the thing he deems a sufficiently original idea that has possibly been appropriated (“the only remaining similarity is the core [...] bass line structure”), and the other time as a schema that is augmented by more specific similarities between the songs (“the similarities here transcend this core structure”). He also seems to at least nominally violate his own evidentiary ruling by referring to specific lengths of time (“lasting 13 seconds”), which of course is based on the recording of *Taurus* rather than merely its deposited sheet music. A more significant problem lies in the statistic about the near-80% note-match between the songs, an assertion in one of the plaintiff’s expert reports and cited by the judge in his determination that the songs passed the extrinsic test for substantial similarity. This issue will require looking closely at the pitch content of both songs.

Example 1 offers the pertinent section of the 1968 deposit copy of *Taurus* held by the Library of Congress. Judge Klausner ruled this musical notation as the only material under protection. Table 1 re-renders the relevant portion of a declaration by Alexander Stewart, the lead musical expert for the plaintiff.¹² The original caption for this example reads “Acoustic guitar themes in ‘Taurus’ and

11 Skidmore v. Zeppelin et al. 2016d, Section VII, C, 2.

12 Skidmore v. Zeppelin et al. 2016b, Example 1.

‘Stairway to Heaven.’” The numbers across the top indicate a half-note pulse relative to the *Taurus* deposit copy, in groupings of four. Tones fall either in the first half of each pulsing segment or the second half, and the bass notes are separated into a lower level for each song. It is clear from a comparison of Example 1 with the top of Table 1 that the latter is not based on the former; rather, the transcription of *Taurus* in Stewart’s chart is clearly based on the acoustic-guitar part in the full recording (which I will discuss momentarily). In his analysis accompanying Table 1, Stewart opines:

With two slight re-orderings, swapping CE for EC, 14 of the first 18 eighth-note positions or slots (78%) contain the same pitches. Since these pitches, C and E, are both present in T[aurus] (on the second and fourth beats) and they are chord tones in A minor they are virtually interchangeable.¹³

This is the near-80% argument that the judge found compelling and deemed suitable to cite in his own determination regarding the extrinsic test. Yet since this analysis is plainly based on a transcription of the full recording of *Taurus* rather than on its deposit copy, the judge’s citation of the near-80% statistic represents another departure from his own evidentiary ruling.



Example 1: Excerpt from 1968 Deposit Copy of *Taurus*, 22 December 1967, Library of Congress

	1	2	3	4	1	2	3	4	1
TAURUS	C	ECB	C	ECB	C	ECB	C	ECB	C
	A	A	G#	G#	G	G	F#	F#	F
HEAVEN	C	E	A	B	E	C	B	C	E
	A		G#		G		F#	D	A
								F#	A
									F#
									E
									C
									F

Table 1: Alexander Stewart, “Acoustic guitar themes in ‘Taurus’ and ‘Stairway to Heaven’”; Plaintiff Chart of *Taurus*¹⁴

¹³ Ibid., §15.

¹⁴ Skidmore v. Zeppelin et al. 2016b, Example 1.

Example 2 offers my own staff-transcriptions of the recording of each song, in analogous eighth-note settings (even though the *Taurus* deposit copy is notated in quarter notes). The accompanying Audio Example 1 presents both recordings simultaneously, adjusted only slightly for tempo and rubato. In each song, the guitar pattern involves slight changes as it repeats, as one would expect in a semi-improvisational setting; Example 2 specifically transcribes the first four bars of each guitar part. I created my transcription of *Taurus* after Stewart made his chart, but I had not yet seen his chart when I made my transcriptions, so these were made independently; there are differences throughout between my and Stewart’s work, but these are relatively small. My own analysis of pitches (not pitch classes) articulated at the same positions in each guitar part is indicated by circles; parentheses indicate notes an octave off. Over the entire first four measures, I count ten matching pitches, and twelve matching pitch-classes; both are lower than Stewart’s 14/18 finding. (To get 14, Stewart assumes octave equivalence, and also twice reorders C and E because as “chord tones in A minor they are virtually interchangeable.”)

The image shows two staves of musical notation for acoustic guitar. The top staff is labeled 'Stairway acoustic guitar' and the bottom staff is labeled 'Taurus acoustic guitar'. Both are in 4/4 time. The 'Stairway' staff shows a sequence of eighth notes and chords, with some notes circled. The 'Taurus' staff shows a similar sequence of eighth notes and chords, also with some notes circled. The notation includes various chord symbols and rhythmic markings.

Example 2: Led Zeppelin, *Stairway to Heaven* and Spirit, *Taurus*; Doll Transcriptions and Analysis

 https://storage.gmth.de/proceedings/articles/39/attachments/p17-02_audio_01.mp3

Audio Example 1: a. Spirit, *Taurus* (*Spirit*, Columbia Records, CD 480965 2, Track 4, 0:39–1:19, originally 1968, acoustic guitar riff), b. Led Zeppelin, *Stairway to Heaven* (*IV*, Atlantic Records, CD 19129-2, 0:00–0:31, originally 1968, acoustic guitar riff), c. *Taurus* and *Stairway to Heaven* played simultaneously

Downplaying these resemblances, the defendants’ musical experts pointed out that the repetition of the A section contrasting with a longer B section, resulting in AABA (a fact mentioned by the judge), is not original but schematic (my word, not theirs). Likewise, they heavily emphasized the ubiquity of the chromatic des-

cent (a “minor line cliché”).¹⁵ Lawrence Ferrara, the main defense expert, offered several examples of chromatic descents, among them: *Dido’s Lament*, *Chim Chim Cher-ee*, *A Taste of Honey*, *Michelle*, *Walkin’ My Baby Back Home*, *Spring is Near*, *Cry Me a River*, *What are You Doing the Rest of Your Life*, *More*, *Music to Watch Girls By*, *How Insensitive*, *Night and Day*, *One Note Samba*, *Summer Rain*, and *Meaning of the Blues*. The chromatic descent is thus incontrovertibly schematic, and one cannot copyright a schema.

Yet my understanding of the judge’s ultimate argument for substantial similarity hinges not on any single schematic resemblance, but rather on the particular *combination* of multiple generic features. Add together the generic form of AA-BA, with the chromatic descent, plus the key of A Minor, and you are on your way to proving similarity that might be considered substantial, if not exactly striking. On top of this, consider the unusual doubly long lower submediant F, plus a turnaround measure that fails to emphasize the dominant E, and you have passed the extrinsic test. Judge Klausner did not cite these two highly unusual features in his own argument, but to me, these are the most compelling parts of the comparison, and it is to these details that the remainder of this essay will dedicate itself.

The Drooping Schema

In my book *Hearing Harmony*, I identify the chromatic lamento pattern by the name the “drooping schema,” or the “droop,” written as $1-^{\uparrow}7-^{\downarrow}7-^{\uparrow}6-^{\downarrow}6-5$.¹⁶ (This notation employs up and down arrows independent of mode, obviating analytical commitment to major, minor, mixolydian, or any other scale or mode.) In *Taurus* and *Stairway*, the dominant scale degree 5 is not stated independently of the tonic 1, but it does occur as the chordal fifth of the tonic if the pattern is restated, as it often does if sometimes after a brief delay. *Taurus* and *Stairway* both repeat the pattern.

A typical case of the drooping $1-^{\uparrow}7-^{\downarrow}7-^{\uparrow}6-^{\downarrow}6-5$ schema in the rock era is The Beatles’ *Michelle* (1965), one of the songs on the list of chromatic descents offered by defense expert Ferrara (Tab. 2a, Audio Ex. 2a). The song opens with an in-

15 Skidmore v. Zeppelin et al. 2016a, §12.

16 Doll 2017, 157–159. See also Everett 2008.

strumental drooping pattern played on Paul McCartney's acoustic guitar, with two chords per bar until a slowdown at the lower submediant. But it then proceeds to a V chord for a full measure, does not repeat, and is in F instead of A. (It also does not arpeggiate, although the arpeggiation in *Taurus* lies outside the sheet-music defined boundaries.)

Chim Chim Cher-ee from the film *Mary Poppins* (1964) was also on Ferrara's list, and additionally was cited while Jimmy Page was testifying on the stand (Tab. 2b, Audio Ex. 2b). This song repeats the drooping line, but as part of a phrasal period structure, with prominent 5s at each cadence and a #4 further emphasizing the dominant before the initial half cadence. It is also in the wrong key of C and wrong meter of 3/4.

In my opinion, the best counterexample the defense offered attempting to show how generic the similarities between *Taurus* and *Stairway* are was the Modern Folk Quartet's 1963 recording of *To Catch a Shad* (1963, Tab. 2c, Audio Ex. 2c). This track is set in a slightly sharp *Ab* Minor (as close to A as one could get without actually being in A), and it has many of the same kinds of sonorities resulting from the combination of tonic-triad members held over a chromatic bass. In his live testimony in front of the jury, defendant expert Rob Mathes plucked out the notes to *Taurus* on an acoustic guitar while the recording of *To Catch a Shad* played underneath (another apparent, if seemingly unavoidable, violation of the evidentiary ruling, because of the introduction of timbre into the mix). Adjusted for tuning, I imagine this tactic could have been quite convincing to jury members, especially since the first iteration of the drooping pattern in *To Catch a Shad*, appearing in the instrumental opening, does not descend directly to 5 in the bass; it instead goes to 1, with the 5 as an upper-voice, similar to what happens in both *Taurus* and *Stairway*. However, the lower 6 is not held longer, and in the sung portions of the track, 5 does arrive before 1.

Many other songs have comparable features, including The Beach Boys' *Surfer Girl* (1963), Lou Johnson's (*There's*) *Always Something There to Remind Me* (1964), Bob Dylan's *Ballad of a Thin Man* (1965), The Left Banke's *Walk Away Renée* (1966), Frankie Valli's *Can't Take My Eyes Off of You* (1967), Jethro Tull's *We Used to Know* (1969), and David Bowie's *Wild Eyed Boy from Freecloud* (1969). Yet of all the examples I have come across of the drooping pattern in the rock era, and even in pre-rock precedents, *Taurus* and *Stairway* are structurally closer to one another than they are to any of the other cases. I have not found any other example where the descent lingers doubly long on the lower 6 and also does not wind up on an obvious 5 before proceeding to 1.

a.

$$1 - \uparrow 7 \mid \uparrow 7 - \uparrow 6 \mid \uparrow 6 \mid 5$$

$$F - E \mid E\flat - D \mid D\flat \mid C$$

b.

$$1 - \uparrow 7 \mid \uparrow 7 - \uparrow 6 \mid \uparrow 6 - 5 \mid \sharp 4 - 5 \parallel 1 - \uparrow 7 \mid \uparrow 7 - \uparrow 6 \mid \uparrow 6 - 5 \mid 5 - 1$$


$$C - B \mid B\flat - A \mid A\flat - G \mid F\sharp - G \parallel C - B \mid B\flat - A \mid A\flat - G \mid G - C$$

c.

$$1 - \uparrow 7 \mid \uparrow 7 - \uparrow 6 \mid \uparrow 6 - 1$$

$$A\flat - G \mid G\flat - F \mid F\flat - A\flat$$

Table 2: Other Examples of the Drooping Schema, $1-\uparrow 7-\uparrow 7-\uparrow 6-\uparrow 6-5$: a. The Beatles, *My Michelle* (1965, guitar intro), b. Mary Poppins, *Chim Chim Cher-ee* (1964, verse and chorus), c. Modern Folk Quartet, *To Catch a Shad* (1963, instrumental iterations)

 https://storage.gmth.de/proceedings/articles/39/attachments/p17-02_audio_02.mp3

Audio Example 2: a. The Beatles, *My Michelle* (*Rubber Soul*, Parlophone 1987, CDP 7 64660 2, Track 7, 0:00–0:10, originally 1965, guitar intro), b. Mary Poppins, *Chim Chim Cher-ee* (*Original Motion Picture Soundtrack*, Walt Disney Records 1989, CD-016, Track 14, 0:06–0:22, originally 1964, verse and chorus), c. The Modern Folk Quartet, *To Catch a Shad* (*The Modern Folk Quartet*, Warner Bros. 2013, CD, WQCP-1414, Track 9, 0:00–0:15, originally 1963, instrumental iterations) (see Table 2)

One brief but necessary point of clarification regards the exact nature of the schema in question. Table 3 (left column) lists six additional popular tracks, from around the same time period, that also feature chromatic descents in A. Notice that Led Zeppelin’s own, earlier, *Babe, I’m Gonna Leave You* (1969) falls into this category, a song Zeppelin falsely credited on the first Zeppelin album as “traditional arranged by Page,” but in later pressings properly credited partially to Anne Bredon who wrote the song circa 1960 (although this original did not feature a chromatic bass at all). The descents in all these tracks in the left column of Table 3 are not quite the same as the full drooping schema. Instead of descending from scale-degree 1 to the leading tone, they go from 1 down to the subtonic, skipping over the leading tone entirely: $1-\uparrow 7-\uparrow 6-\uparrow 6-5$. Hence the pattern is one note short of the droop, and so I call it the “drop.”¹⁷ (One fewer “o”.) In the rock era, the shorter dropping schema is probably even more common than the longer

¹⁷ Doll 2017, 159–162.

drooping schema, and deserves to be acknowledged as a separate entity rather than conflated into one category as they sometimes are.¹⁸ The right column of Table 3 offers additional high-profile examples of the drop from that same time period, but not in A. Yet even with all these descending examples set aside, it should be clear by this point that pertinent, if not exactly analogous, comparisons to *Taurus* and *Stairway* are still plentiful in 1960s repertory.

in A	not in A
The Animals, <i>House of the Rising Sun</i> (1964)	Chicago, <i>25 or 6 to 4</i> (1970)
Donovan, <i>Hampstead Incident</i> (1966)	Bob Dylan, <i>It's Alright, Ma (I'm Only Bleeding)</i> (1965)
The Beatles, <i>Lucy in the Sky with Diamonds</i> (1967)	The Yardbirds, <i>For Your Love</i> (1965)
The Beatles, <i>While My Guitar Gently Weeps</i> (1968)	The Lovin' Spoonful, <i>Summer in the City</i> (1966)
Led Zeppelin, <i>Babe, I'm Gonna Leave You</i> (1969)	Paul Revere and the Raiders, <i>(I'm Not Your) Steppin' Stone</i> (1966)
	The Beatles, <i>Magical Mystery Tour</i> (1967)
	The Beatles, <i>Dear Prudence</i> (1968)
	Nilsson, <i>One</i> (1968)

Table 3: contemporary examples of the dropping schema 1-⁺7-⁺6-⁺6-5

Verdict

I personally understand the judge's and the jury's divergent decisions regarding substantial similarity in this case, which is one reason why I find this situation so fascinating – it seems to me right down the middle, especially in light of Led Zeppelin's highly checkered past of unabashed appropriation.¹⁹ Such a split decision does seem problematic, though, when it comes at the ostensibly objective, extrinsic stage. If this is objective, there would not seem to be much room left for the subjective, intrinsic test, which is still a legal test and would not delve into matters of, say, aesthetic value. I must state unequivocally that the legal decision before us has absolutely nothing to do with valuing one song over the other. Many musical commentators I have read or heard speak about this case have been quick to point out the Zeppelin song is much better than the Spirit one, as if

¹⁸ The drop and droop are mixed together, for instance, in Ross 2010, 53.

¹⁹ See, for example, Headlam 1995.

this absolved Zeppelin of any alleged wrongdoing even if they did borrow protected material. That accurate aesthetic assessment is ethically immaterial; the ends cannot justify the means.

At any rate, my aim in this article has been not to solve the issues of “*Skidmore v. Zeppelin et al.*” but rather to shed light on what the issues in fact are in this high-profile case, and what role music theory has played in their determination. As I have gathered from my current research into past and present lawsuits, the fundamental issues identified here turn out to be regulars: (1) defining the work and its protected aspects (and sticking to these definitions!); (2) assessing the accuracy of existing transcriptions, or making more accurate new ones; (3) defining the metrics of similarity; and (4) distinguishing between original, schematic, and appropriated features.

Stepping back from this particular case, I wish to assert that forensic musicology in general, instead of only occasionally receiving attention from the academic musicological disciplines, is something all theorists should be versed in, if not actually practicing. Who better to have informed opinions about such matters? To boot, it is perhaps the most immediately consequential activity one could imagine a music scholar undertaking, with ramifications not only for the legacy of valued artists but also for the possibilities of future artists, whose work will undoubtedly be shaped by the legal constraints of the courts’ decisions. We have already seen an obvious effect of court rulings on the practice of sampling in the world of hip hop: long gone are the sample-heavy collage works of the 1980s and ‘90s, from the likes of John Oswald, Public Enemy, and others. Taking notice of forensic musicology not only makes for good scholarly citizens, it comes with benefits for the academic musicological disciplines as well, particularly music theory, a profession historically isolated from even its closest musicological siblings, let alone the general public. Social utility is never a bad thing for an academic to provide. Regardless of how one feels about this particular case, my hope is that theorists can contribute more to the conversation about it, and about the seemingly endless line of substantially similar cases in front of us.

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