

The Humans and the Machine: Perceptual Differences Between Collective and Solo Performances

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Abstract

This article provides a thorough comparison between two live performances of Jacob Collier's song "Don't You Know": his 2015 performance with the band Snarky Puppy, and his performance during his 2016 One-Man Show, a multimedia display of multi-instrumental virtuosity using custom equipment. These two performances are published on YouTube with similar popularity, and a concise analysis of the comments is supplied, providing useful insight into the audience's interests and behaviour. The parameters in each performance are similar enough to isolate the *performer* factor and answer key questions regarding differences when performing as an individual or a collective. The conclusions of this research highlight how the venue layout influences engagement, how the discourse within the virtual audience shifts between the different renditions, and how the Snarky Puppy collaboration stands out as a more impactful interpretation due to their effective manner of communication with the audience through controlled nuance of musical gestures.

KEYWORDS: Live Music, Audience Perception, Performance, Technology, Medium, Virtual Audience

Introduction

Hailed as "jazz's new messiah" (Lewis 2015), Jacob Collier has been recognized as one of the most innovative musicians of our time. Not only is he pushing the limits of his music in compositional terms with his intricate and complex productions, he is also breaking new ground with the use of technology in music performance. This young two-time Grammy winner's journey began by uploading multi-track performances of himself to his YouTube channel. His fame and recognition on the internet eventually led him to Quincy Jones, who is now his manager and mentor.

This article analyzes and compares two performances of Jacob Collier's song, "Don't You Know", released in July of 2016 on *In My Room*, an album praised for its "dazzling

exuberance and virtuosity” (Fordham 2016). Before this release he was invited in 2015 to perform the song as part of the album *Family Dinner - Volume 2*, by the three-time Grammy winning band Snarky Puppy. This performance was distributed as a DVD special and uploaded to YouTube (groundUPmusicNYC 2016), where it has garnered over three million views.² Around the same time and for the next two years Collier toured around the world with his cutting-edge One-Man Show, a display of multi-instrumental virtuosity where he simulates a digital one-man band using custom equipment built by Ben Bloomberg, a Massachusetts Institute of Technology graduate student. These performances include a vocal harmonizer that allows Collier to sing twelve-part vocal harmonies and a series of looping stations for various instruments, plus a video element generated from 3D cameras that enable him to replicate multiple iterations of his image that are projected onto a screen (Cawley 2017).

The solo performance that will be analyzed is his 2016 live show at the Village Underground in London, England (Jacob Collier 2016). Although there are several renditions of his live show online, this specific video is hosted on Collier’s own channel and has the most comments and views. The two videos mentioned are the main source for this analysis, and they were selected because of their proximity in terms of dates and popularity.³ The special software used for this research was the NVivo program for comment analysis and the Logic Pro X digital audio workstation for audio analysis.

The parameters in each performance are similar – the same song, with the same singer, in front of a live audience and with a virtual audience participating through the YouTube comments. In addition, both videos were created with a high-quality production and multi-camera setups that facilitate an immersive experience for the online viewers. These features isolate the *performer* factor and allows the following questions to be addressed: what are the differences when performing as an individual versus a collective? Are these

differences reflected in the audience's discourse and preferences? What is uniquely achievable in each specific format and how is the message more effectively conveyed?

A meticulous analysis of the performances as perceived from the videos produced and published on YouTube is provided and the differences and similarities are highlighted. In addition, a concise analysis and categorization of the comments is supplied as an ethnographic method for useful insight into the audience's inclinations and behaviour. With this, the aim of this article is to provide valuable research concerning the dynamics and contrasts between solo performance and band performance and the influence these two formats may have on audience perception.

One-Man Show Analysis

These analyses will be divided in the sections detailed in TABLE 1 and TABLE 2. The structural differences between versions are colored and will be discussed in the corresponding section. It is important to note that detailed lyric analysis and harmonic analysis are beyond the scope of this article. However, when appropriate, some relevant details will be provided when they contribute to the broader context of the analysis.

TABLE 1. Structure of Solo version.

Section	INTRO	VERSE 1	PRE-CHORUS 1	CHORUS 1	INTERLUDE 1	VERSE 2	PRE-C 2
Length (measures)	20	16	8	8	6	16	8
Subphrases	4m x 5	4m x 4	4m x 2	4m x 2	5m 1m	4m x 4	4m x 2
Measure	0 20	36	44	52	57 58	74	82
Time Signature	7 4		5 4	7 4	5 4 3 4	7 4	5 4
Timecode	00:05	00:57	01:39	01:54	02:15	02:26	03:07

Section	PRE-C 2	CHORUS 2	PIANO SOLO			INTERLUDE 2	VERSE 3	PRE-C 3	CHORUS 3	OUTRO	
Length (measures)	8	8	40			6	16	8	8	64	
Subphrases	4m x 2	4m x 2	4m x 6	4m x 2	4m x 2	5m 1m	4m x 4	4m x 2	4m x 2	4m x 4	4m x 12
Measure	82	90	114	122	130	135 136	152	160	168	184	232
Time Signature	5 4	7 4	5 4	7 4	5 4	3 4	7 4	5 4	7 4		5 4
Timecode	03:07	03:22	03:43			05:23	05:33	06:15	06:30	06:51	09:04

The solo version contains certain stylistic elements that can be traced to funk, soul, and other genres within the spectrum of jazz fusion. These characteristics will be addressed

when present in their respective section. Harmonically speaking, the piece follows a consistent exchange between the C dorian and F mixolydian modes. F mixolydian, which can be interpreted as the subdominant region, is visited during the several pre-choruses and every time the time signature changes to 5/4. All the other 7/4 sections, including verse and chorus, return to the main C dorian sound. This pattern continues after the modulation a half-step above during verse 3 and pre-chorus 3.

INTRO. The song begins with a continuous stream of eighth notes playing a B \flat /E \flat perfect fourth in a 7/4 time signature at a tempo of 160 beats per minute [00:05].¹ This ostinato is played on the piano and loops every measure, with a slight accent on the first, eighth, and twelfth eighth notes. This syncopation before beats five and seven in the 7/4 context results in a sense of forward motion. This motor rhythm continues to appear throughout the song and holds together the atypical 7/4 time signature. Most phrases are in groups of four measures, oftentimes repeated either two or four times. One difference from the original album recording is an extra phrase for a total duration of twenty measures.

Collier begins by playing a pattern on different instruments each measure, sometimes allowing a full measure of looping to occur without him so he can move around when the instruments are far apart. The first loops are of piano and multiple non-pitched percussion instruments, including sleigh bell, shaker, cowbell, and slit drum. The perfect fourth ostinato is not enough by itself to provide harmonic context, but the voicing of the chords of the second piano loop [00:10] suggest a C dorian sound, corroborated by the bass loop a few measures later [00:36].

The first measures of the song illustrate the dynamic that will unfold during the rest of the performance: Collier will be initiating different loops with several instruments adding layers to the song, a common dynamic of other live looping performers. However, it is

crucial to note that not all the sounds heard are recorded by him in real time. Due to the complexity in the construction of this piece, there are accompanying tracks that fill in the rest of the parts. This factor became a point of contention in the comments, with some commenters expressing disappointment or disbelief like: “Well half of it are samples here and definitely not live. Agreed? Now he is certainly great, but in this show I’m not even sure he sings live...” (jjj13031984 2018); and “Too difficult to recognize the live effort with the precoded(sic) vocals and sounds, except for the brilliant solos. I prefer Jacob with a band” (lalloghin 2016).

VERSE 1. This is the first time that Collier sings with his harmonizer [00:56] and the first time his face appears on the multimedia setup projected behind him, while addressing the audience for the first time and lifting his arm up over his head to invigorate them. Due to the ambiguity of the 7/4 time signature, the start of the verse feels somewhat abrupt. The faces projected reflect the number of voices in the chords he is playing, so while some listeners may not understand this reference, one can assume that subliminally they can make the connection that the more faces they see the denser the sound is. The combination of these factors results in cheers of enthusiasm from the audience.

Collier lands every downbeat on a five-part Eb lydian chord, and for the rest of the line he sings diatonically within the C dorian mode, moving in parallel with triads harmonizing the melody. It is in this verse when the drum kit groove begins in the playback, alongside a bass synthesizer and other percussion sounds. Each time Collier lands on the downbeat with the sustained chord, he uses this moment to connect with the audience by looking at them and changing his facial expression to reflect the chord changes, making the harmonic movement move evident.

PRE-CHORUS 1. The pre-chorus feels more energetic by reducing the time signature to 5/4 and due to an increase in the percussion activity with a track of claps on every beat

and a tambourine playing sixteenth notes on the offbeat eighth notes [01:39]. Collier moves to the upright bass to play a rising bass line that emphasizes the first and sixth eighth notes, dividing the measure exactly in half. This section is only two four-measure phrases, and despite the change of time signature the groove resembles the previous section with its use of syncopation. Some additional instruments in the background mix include claps, cuica, tambourine, synthesizer, and piano chords.

CHORUS 1. This first chorus returns to the 7/4 pulse and the C dorian zone [01:54], with the groove feeling somewhat less hectic now without the tambourine. The chorus makes it evident that Collier is not playing all the sounding instruments; he is singing and moving in the centre of the stage while only playing a shaker as the drum kit, bass synthesizer, keyboards, and initial motor rhythm are sounding in the background. At the same time, a distinct piano riff appears during the second phrase [02:05], built with stacked fourths over two measures as indicated in FIGURE 1. This gesture will become a recurring motif throughout the song, repeated twice during this second phrase with minimal variation.



FIGURE 1. Piano riff.

INTERLUDE. The texture dramatically changes during this interlude [02:15], with claps on a seven-eighth note rhythmic pattern, glittery sounds of bells, and synthesizer chords above a 5/4 groove. The drums, bass, and other synthesizers join right before transitioning to the next verse. The interlude alternates between a Dm7 chord in first inversion and a Cm7 chord in second inversion over an F bass, once again indicating a subdominant region. Collier uses this interlude to play an energetic but brief piano solo, given that this transition only lasts for eleven seconds. This interlude matches the structure of the

original version, built with an ambiguous combination of five measures of 5/4 and one of 3/4. The sense of pulse is further distorted with the drum kit groove starting on the last beat of the second measure.

VERSE 2. During this verse Collier still uses the first measure of each phrase to address the audience or to alter the held chord [02:26]. In the latter case, each new line of the verse presents a slightly more chromatic chord reflected with the visual effects, making it stand out from the previous verse.

Something critical occurs during the last line of this verse at the [03:02] mark. Collier is physically alternating between playing the harmonizer and the synthesizer, but after singing the last line he does not go to the synthesizer to play the piano riff. Yet, the riff is still heard as he adjusts some settings in his harmonizer. Although the use of backing tracks has been discussed previously, the difference in this case is that he was previously giving the impression of actually playing the sounds heard. At first glance this indicates one of two possibilities: either he was pretending to be playing, or he played a different virtual instrument with a sound which was too difficult to discern from the mix.

The audio in question was extracted from the second (when he is at the synthesizer) [02:36] and fourth lines (when he is not) [02:57], and with the help of spectrum analyzer software⁴ their spectrograms were compared. Initially, the only noticeable differences both visually and aurally were the more active tambourine and bass lines of the fourth line. However, a very soft, drawbar organ-like timbre was noticeable, only audible briefly from [02:42] to [02:43]. By whistling and analyzing this sound and overlapping its frequency range on the excerpts' spectrograms, the corresponding frequency was found between 1797 and 2230 Hertz (FIGURE 2a). Interestingly, a sound can be found within this register on the third transient that only appears in the excerpt when Collier is at the

synthesizer (FIGURE 2b), but not when he is away from it (FIGURE 2c). This corroborates that he was playing an additional instrument while at the synthesizer.

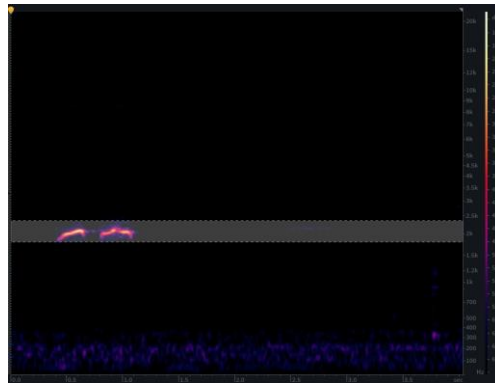


FIGURE 2a. Spectrum of whistle.

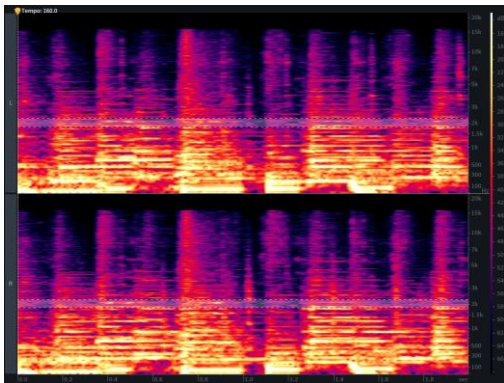


FIGURE 2b. Spectrum of riff with organ.

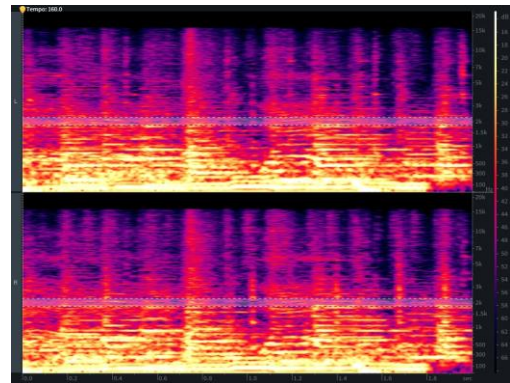


FIGURE 2c. Spectrum of riff without organ.

PRE-CHORUS 2. The second pre-chorus is almost identical to the previous one, with a few exceptions. Collier is also singing while playing bass, although with slight variations to the bass line he plays, illustrating the improvisational nature of the performance [03:08]. Additionally, there are two new musical gestures: The first one is a frenzied “out-of-tune” synthesized banjo line [03:19] moving in fast sixteenth notes with angular motion (FIGURE 3) leading into the second one, a quick riff played on MIDI brass. The first gesture becomes a staple of this version, and while Collier never performs it in real time, it will appear several more times in extended iterations to contribute to the hectic character of the song.



FIGURE 3. Banjo Frenzy.

CHORUS 2. Although the second chorus [03:23] is very similar to the previous one, the piano riff is now played in both phrases, finishing with the banjo riff appearing briefly.

PIANO SOLO. This section [03:44] is one of the main differences between versions, as expected from the improvisational nature of a piano solo. The sounds in the background include atmospheric synth pads, a tambourine and snare accenting beats three and seven, very subtle but fast hi-hats, and a bass line riff illustrated in FIGURE 4 that emphasizes beats one and three alternating between C and B \flat pitch centers [04:05], among other subdued sound effects. For a few measures, while he improvises on the high register of the piano with his left hand, he continues to manipulate parameters with the other hand of the sustained chord he previously sang.



FIGURE 4. Bass riff.

The general mood at the beginning is that of serenity, but the subtle internal activity of the drum kit and bass slowly grow in volume, increasing the number of events happening per beat. This textural growth is given even more momentum with Collier's solo, which morphs from gentle melodic lines in the C dorian realm into a quick line from the bottom of the piano [04:36] to the top, moving back down over the D minor pentatonic scale. This leads into a low E \flat anticipating the transition to the more energetic section in F. This region [04:47] is highly energetic and moves back to the 5/4 and the subdominant zone. His virtuosity is immediately on display with constantly syncopated rhythms, a flurry of

notes covering the extremes of the piano, and fast interlocked chords that show his proficiency with the instrument. These pianistic fireworks are projected onto the screen behind him and accompanied by a pulsating light show, which augments the multimedia experience.

INTERLUDE 2. The frenetic solo is followed by a pause in the percussion activity [05:23] before a dramatic growth to the verse. This interlude follows the same harmonic and rhythmic content as the previous one and is not present in the Snarky Puppy version.

VERSE 3. The intensity of this transition is further amplified with an abrupt modulation one half step above [05:33]. Collier sustains the first line of the verse on an (E, F#, B) chord for a full measure, creating suspense and causing a reaction from the audience. The next line [05:42] is an even more impactful moment, where he sings a seven-part harmony chord progression from C#m^{9/11} to E^{9/13} arriving to an F#^{9/11/13} on the downbeat of the next measure. This specific chord progression causes several of the members of the audience to gasp in awe, audible thanks to the rare and brief opening in the texture of the music. It is possible that this reaction is caused by the addition of a deep bass line for the first time over the word “world” and under the heavily harmonized melody. Combined with the subsequent dramatic silence, this provides an exemplary use of Collier’s manipulation of harmony. It is worth pointing out that this precise moment is the most referenced timecode of the video in the comments, with over ten commenters sharing their emotional reaction to this specific moment.⁵ There are two heavy outbursts of fast-paced drum and bass riffs connecting the aforementioned vocal lines, the first one with dubstep and electronic qualities [05:38] and the second one more reminiscent of African drums [05:49]. The third and fourth line of this verse return to the groove present in the previous verses, but with a thickly syncopated bass line added on the offbeats.

PRE-CHORUS 3. The only difference to previous instances of the pre-chorus is that the accompanying track now includes more of the synthesized brass sounds and the frenzied banjo riff previously mentioned [06:15].

CHORUS 3. The music stealthily modulates back to the original key one half-step below for the third and final chorus [06:30]. It is almost identical to the previous one, with the exception of a mostly empty first measure that only includes a disappearing bass line in addition to the vocal line.

OUTRO. The texture is suddenly reduced to only a few instruments playing atmospheric gestures [06:51]. The opening perfect fourth on the piano is brought back subtly, in combination with an almost pitch-less organ, sparse percussion elements, and the bass riff mentioned in the piano solo shown in FIGURE 4. This riff becomes a useful marker for keeping track of the groove in the 7/4 signature, especially because of the sparse texture. This happens while Collier moves between several instruments, adding textural gestures to the mix. The track gets momentarily detuned for a four-measure phrase, before returning to the main groove evoking the initial instrumental loops [07:12]. Just as in the beginning, Collier goes back to sitting down while recording different percussion loops, including cowbells and drums.

The music changes one final time to a 5/4 signature that introduces different musical elements present in the song thus far [07:33]. During this highly active outro Collier continues to switch between piano, bass, and synthesizer, before finally settling on the drum kit. Several layers begin to fade out only leaving by the very end the piano riff, a kaleidoscopic flurry of bells, and Collier on the drums. Despite the decreasing texture, the volume of the ringing bells remains loud and maintain a busy atmosphere of incessant internal energy, which themselves reflect the frenetic character of the entire performance.

Snarky Puppy Band Analysis

This version was arranged by Jacob Collier and Michael League, bandleader of Snarky Puppy. The structure is mostly the same, with some differences in the duration of the first interlude and the piano solo, and a completely rearranged outro as can be seen in TABLE 2. The texture tends to be much sparser, lacking the additive layers of loops, with clearer stylistic features of funk and jazz fusion. Nonetheless, there are structural cues that are still followed, but by nature of the setup they tend to be a lot more flexible and improvisational. This interactivity between musicians is in stark contrast to the stratified growth of the solo version, with echoic responses to each other's gestures that build up the tension organically.

TABLE 2. Structure of Band version.

Section	INTRO	VERSE 1	PRE-CHORUS 1	CHORUS 1	INTERLUDE 1	VERSE 2	PRE-C 2	
Length (measures)	20	16	8	8	8	16	8	
Subphrases	4m x 5	4m x 4	4m x 2	4m x 2	4m x 2	4m x 4	4m x 2	
Measure	0	20	36	44	52	60	76	84
Time Signature	7/4		5/4	7/4	5/4	7/4	5/4	
Timecode	00:00	00:53	01:35	01:50	02:10	02:26	03:07	

Section	CHORUS 2	PIANO SOLO	VERSE 3	PRE-C 3	CHORUS 3	INTERLUDE 2	CHORUS 4	OUTRO	
Length (measures)	8	64	16	8	8	8	16	16	12
Subphrases	4m x 2	4m x 16	4m x 4	4m x 2	4m x 2	4m x 2	4m x 4	4m x 4	N/A
Measure	92	156	172	160	168	176	192	208	220
Time Signature	7/4			5/4	7/4				
Timecode	03:22	03:43	06:32	07:14	07:29	07:50	08:11	08:53	10:12

The layout of the stage plays a substantial factor in the relationship between the musicians and the audience. The solo version is presented in a typical proscenium stage, while the Snarky Puppy layout is rather unique – it consists of three concentric rings, with some members of the audience in the very center, the musicians surrounding them in an outer circle, and another layer of audience members enclosing them. Furthermore, every listener and musician in the venue is wearing high-quality headphones, adding the artistry of the sound engineer into the picture. This rare setup strengthens the collective ethos of

the band by removing the focus from a single individual. It also allows the performers themselves to have visual contact and direct communication with each other and encourages the listeners to identify with the way others are enjoying the performance, deepening the experience.

INTRO. The song begins with the same repeated perfect fourth ostinato as in the solo version but on a synthesizer and with no hint of the pulse [00:00]. This pattern combined with sporadic interjections of other instruments create even more ambiguity and buoyancy. These atmospheric effects set an appropriate mood for the growth towards the first verse, and most members of the band get a chance to participate, albeit in a rather subdued way more akin to orchestral coloration. The first three phrases include the percussion instruments, echoes between the organ and piano, and electric guitar effects, with the bass joining during the last four-measure phrase using the riff shown in FIGURE 4 [0:32].

VERSE 1. A big difference from the previous version is that Collier's only instrumental changes are between playing the piano and singing with his harmonizer. Furthermore, he is being backed up by three singers [00:53], and even though his timbre is enriched it restricts the variability of his suspended chords in the harmonizer. This limitation is immediately noticeable in the downbeats of each phrase, since in this version they almost always land on the same chord with minimal changes.

The instrumental accompaniment is also much cleaner, with minimal percussion and occasional organ and bass interjections. One could argue that the groove is even more prominent here due to the spaciousness, which makes the attacks more piercing due to the lower ratio of events per second. One of the main reasons for this sparser texture is because the drum kit only emphasizes beats one and three, as opposed to beats one, three, five, and seven of the solo version. This subtle difference gives these measures a 7/4 feel

instead of a combination of $4/4 + 3/4$. This is a key factor in the distinct grooves between versions.

PRE-CHORUS 1. Although both versions contain similar percussion activity in this section [01:34], their presence is less intrusive in this version specifically because they are human performers. The tambourine's MIDI interpretation in the solo version gives equal velocity values to the notes which translates into louder and busier high frequencies, while the human performers provide a nuanced contribution to the mix. This nuance could also be attributed to the sound engineering of the performance, but it is possibly a combination of both. The musical content is also different, with the synthesizer riffs removed and the other accompanying instruments reduced to organ, piano, guitar, singers, and percussion.

CHORUS 1. By the time the chorus begins [01:50], it becomes evident that Snarky Puppy is more concerned with cohesion on a broader scope. The metric feel discussed in verse 1 is symmetrically applied to the larger structures – the previous sections feel connected as a whole by maintaining the same musical elements, while the continuity of the solo version feels disrupted by constant changes every four measures. The characteristic riff mentioned in FIGURE 1 does not occur here. Instead, the organ and piano add brief gestures at the end of every phrase while Collier's singing is doubled an octave above by the singers. The chorus concludes with a brass hit, introducing the brass section for the first time.

INTERLUDE 1. Instead of dealing with the complicated ambiguity of the interlude 1 in the solo version, this transition is simplified to only eight measures of $5/4$ [02:11], dismissing the metric changes. A reasonable assumption is that this change was made to facilitate the coordination between performers. The texture is atmospheric with

improvisational elements on the organ, piano, and guitars. The content is much less virtuosic with a character similar to the introduction.

VERSE 2. The second verse resembles the solo version with the piano riff in FIGURE 1 appearing consistently for the first time, alternating between the piano and the brass between phrases [02:31]. The introduction of this riff increases the overall activity, with even shorter gestures in the guitars, bass, sousaphone, and organ. These sounds are smoothly introduced mainly as timbral augmentations, creating an almost subconscious growth in texture. A perfect example of this is with the sousaphone doubling the electric bass, a barely perceptible coloration of timbre. In addition, Collier varies the sustained chords more frequently, even singing strikingly dissonant harmonies like the jarring $E_b m$ chord on top of the singers' $E_b M$ chord of the first line [02:26].

PRE-CHORUS 2. This section [03:07] follows the same framework as the previous one, with added piano and organ interjections between phrases. However, the main difference is that the musical gestures discussed in the solo version do not exist in this version. In fact, the banjo riff illustrated in FIGURE 3 does not exist at all, perhaps due to its inhuman speed.

CHORUS 2. This chorus [03:23] contains even more brass interjections with hits between each line. While the narrative arch does seem to grow gradually, its character is considerably less dramatic than in the solo version. Its growth is mainly due to added timbral variety, while its texture remains somewhat sparse in comparison.

PIANO SOLO. The piano solo in this version presents a suddenly softer and relatively simpler and sparser texture [03:43]. The most noticeable difference is the lack of a continuous groove. The only sense of pulse is given with a subtle bass line and at a later point with the drums, but initially there is no metric emphasis. Structurally, this piano solo section accomplishes a consistent linear growth both in texture and volume, in

contrast to the more angular trajectory of the solo version. This is made easier with the simplified underlying structure, consisting of sixty-four measures that continue in 7/4, avoiding the time signature changes altogether.

There are faint effects in the background played on the synthesizer and organ, colouring the significantly more mellow piano solo which traverses through a multitude of moods. It begins with almost hymn-like properties, moving to simple melodic lines with both hands an octave apart [04:46], and finally growing into a climactic explosion of dense chord progressions and fast scales.

As the piano solo develops, the drums gradually provide a consistent motor rhythm, but still with no emphasis on the 7/4 time signature. The distribution of fast sixteenth notes in the snare drum with one drummer and in the hi-hats with another allow the textural density to grow without it becoming too overwhelming. As this development continues, the tambourine is one of the last ingredients added to this gradual crescendo, which in combination with a one-beat pattern on the drums increase the sense of urgency and activity. Almost every performer contributes texturally with a balanced participation, collectively growing towards the climax of the song. The tension is further intensified by the dynamic camera shots and the restlessness of the musicians looking at each other to coordinate the arrival.

VERSE 3. The absence of an interlude allows the tension to be released directly into the third verse with a modulation one half-step above with a majestic E⁹ chord [06:32]. The expert unification of all of these elements makes this one of the most memorable moments of the performance. The dramatic growth to this verse is properly compensated with a combination of three simultaneous and intensely active drummers playing a torrent of drums and cymbals at an incredibly high speed between phrases. This is an effective and clever way to represent the release of energy accumulated at the climax, without

overwhelming the listeners with too much harmonic or melodic information. The rest of the instruments continue with the riffs presented in previous verses except for the sousaphone and electric bass, who play on the offbeats of the third line just like in the solo version [06:53]. One major absence is the specific chord progression of the second vocal line mentioned in the previous version. In this version Collier does not vary his singing as much, perhaps for the benefit of the collective integrity of the ensemble.

PRE-CHORUS 3. The narrative arch momentarily decreases for this section [07:13] with the percussion activity immediately returning to normal, following the same format as the two previous ones. The main change is the presence of a longer brass riff between the vocal lines.

CHORUS 3. This chorus is a radical contrast from previous choruses in both this version and the solo version [07:29]. The entire band stops playing, and Collier is left singing softly with his harmonizer. The only similarity is the modulation one half-step below. The chord progression here is unique – it juxtaposes the C dorian melody over a B \flat M chord and moves down through the quartal chords (G, C, F) – (F \sharp , B, E \sharp) – (F, B \flat , E \flat) in alternating groups of four and three eighth notes of duration. The second line continues descending with a chromatic progression of E \flat 9 – D9 – D \flat 9 – C9/F. The third line repeats the pattern but with a moving bass line on the piano with his left hand [07:38], effectively re-harmonizing the chords above. The fourth line moves even further from the tonal realm, with another chromatic descent of augmented chords from A^{aug} down to E^{aug} atop a hardly discernible bass line. The intention of this chorus seems to purposefully disorient the listener to make the return to the familiar even more impactful.

INTERLUDE 2. This section instantly changes the character, turning into a festive return of the musical motifs presented throughout the song [07:50]. It is built with a two-measure loop of the verse's form, but Collier sings instead slight variations on “raah” and

This outro is only approximately twenty measures long, and as the other instruments disappear from the mix, a poignant piano solo is left as the last surviving element with any sense of pulse almost completely eliminated. After navigating common tone harmonies with a repeating G, Collier finishes with a chord progression of Cm – E^{7b9} – Dm⁷ and arrives to a final F-G-A-B^b tone cluster on his harmonizer, the same cluster as the one in the verses except without the E^b. The character of this piano solo is somewhat melancholic, a profound antithesis to the highly energetic ending of the solo version.

Comment Analysis, *One-Man Show* Solo Version



FIGURE 6. Comment analysis on Solo version.

For this analysis, the comments left on each video were read one by one and grouped into six overarching categories after recurring characteristics emerged between both versions. A classification system was created to easily visualize the discourse between users. The

six categories are *Praise*, *Observations*, *Performative*, *Criticism*, *Music Related*, and *Musicians*. The above diagram displays the categories in sizes proportional to the approximate number of comments in each one as a way of making the main topics of discussion more easily evident.

The total number of comments on this video is 404⁶, and this diagram shows that more than half of the comments are some way of *praise* for Collier's performance. Some commenters praise very specific aspects, such as the visuals: "Amazes me every time. Love the live video looping, so cool!" (Potter 2016); the style of the music: "He is the source of a new genre, it will not be easy for others to copy him, indeed mindblowing..." (Gerard 2016); or his talent: "No human being on earth at this time has this much musicality. Unparalleled" (NotSereyus 2019). Others simply express awe or even describe an emotional reaction caused by it: "I just got full body goosebumps... this has never happened before" (Masella 2018). The second largest category is a very general category of *observations*, where users simply engage with others or point out their favorite parts of the video, referencing the timecode for others to see: "05:44 blew my mind" (Alvarez 2016). This also includes observations about Collier's sartorial characteristics or any kind of humor: "AKA How To Burn Calories If You're A Musical Genius" (theKRUGMEISTER 2019). Since this category includes casual conversations or greetings from international viewers it does not contribute as much to the analysis.

An interesting detail emerges with the third largest category, that of *performative* elements. Due to the nature of the setup, the innovative performative elements are at the center of the discussion: "How is this even possible? Could someone explain how this performance works? Lots of playback and loops but it contains a secret" (Alvarado 2016). Within the scope of these comments some people defend the solo rendition: "...limiting himself to piano and voice could be OK, but this format shows so much of his talent, not

just as a composer but as a performer too” (sidenotes 2016); yet a larger percentage of them explicitly stated their preference of a band setup over a solo rendition: “Great music but would sound so much better with a band” (Muntal 2016).

The next category covers any kind of *criticism*. Here, an interesting phenomenon occurs where every negative comment almost always elicits a response defending Collier’s musical abilities. The following is a good example, where a user remarks: “...I’m sure it took masses of talent to put together... but more simplicity, lyricism, melody, and reaching out to your audience would make your music a lot more approachable” (Harrold 2016) and a user replies: “Simple minds probably won’t find this melodic but to others it’s just perfect” (UnicornHorn 2016). The amount of people defending Collier surpasses the amount of negative comments, but some of these commenters go so far as to reply with somewhat derisive remarks that led to the snob category being included.

The last two categories involve music in some way, the first one includes *music related* topics and the last one is about *musicians*. The former includes discussions revolving around the engineering of Collier’s setup: “As a live looper myself the fact that he’s doing this complex high level stuff and it’s all phase-lock-looped without one problem blows my mind” (aliensporebomb 2016); or specific aspects in the construction of the music: “When you can make it groove while alternating between 7-2 and 5-4, you are a genius” (Steer 2017). The amount of people talking about gear and technology was surprisingly higher than discussions about music theory or chord progressions, which are often a main topic of conversation in Collier’s music. The final category groups users that describe parallels with other musicians: “He and Beardyman should collaborate together!” (AC/KC 2016); and while Snarky Puppy does get mentioned, it is only a few instances: “He doesn’t even need the entire snarky puppy for this song” (Sibarani 2018).

Comment Analysis, *Snarky Puppy* Band Version



FIGURE 7. Comment analysis on Band version.

The sample size for this video is significantly larger than the other version, with a total of 1132 comments left on the video.⁶ This higher count is possibly due to the longer history and thus larger fanbase of Snarky Puppy, which is also reflected in the number of views. The Snarky Puppy version similarly presents a proportional distribution of comments between the *praise* and *observations* categories. This time they include different subcategories, such as praise to specific instruments: “Wowwww, they are so tight. 3 percussionists perfectly keeping it together. Perfect balance... Musical Geniuses” (TheUnorthodoxGears 2017); or stating a sense of shock usually with the use of expletives: “Damn.....Damn.....Just.....damn....” (White 2016). The *observations* category reflects a similar distribution of comments, but there is a larger presence of general questions being asked: “Never heard a sousaphone before, could someone try and

indicate a part in this to me where it can be heard really clearly?” (ForTheOracle 2016); and a few that specifically comment on Jacob’s age: “I want to hear what he does at 24 to 27. His debut was a typical prodigy showcase; all the tricks he can do, lots of covers and traditional styles. What will he do when he finds his own voice?” (modifiedcontent 2018).

The most important difference to note between renditions is the reversal between the *musicians* and the *performative* categories. Besides *praise*, the main discourse in the comments was about *musicians*, whether specifically mentioning Collier or any of the Snarky Puppy members: “Seeing Michael and Big Ed interact with each other is so much fun” (I_Like_It_Here 2017); or pointing out the similarities to other artists they know and suggesting collaborations: “imagine this Jacob Collier + Joe dart + Bernard purdie + Cory Henry heck me it would be fantastic” (Tone 2017). It is interesting to note how the commenters feel the need to share their stylistic taste and experiences when they witness the hybridity of this performance: “Theres(sic) Zappa, Manhattan Transfer, Bruce Hornsby, and more buried in here” (Dean 2017).

The *music related* category centers around the gear and technology used and music theory topics. The main discussions in the former pertain to the brand of headphones used: “They were Audio Technica M50x. They sounded incredible! Highly recommended” (Layne 2016); and choice of instruments: “Looks like the upper keyboard—a Dave Smith Prophet '08—is being used with some type of harmonizer” (Williams 2019); but there is also some discussion regarding the format of the performance: “Wait. Wait. Is the whole audience wearing headphones? If so that had to be the most amazing experience ever. Everyone is in studio headphone land. An engineers dream” (Holder 2018). The latter includes conversations revolving around distinct chords: “that last chord everyone harmonized on almost made me faint” (MindAndSpirit 2017); but the vast majority is

people trying to decipher the unusual groove of the song, with comments like: “Can someone PLEASE take me by the hand and demonstrate/clarify the beats and measurements of this piece? I get totally lost trying to figure out the rhythmic structure!” (skemsen 2017); and “Main groove is 7/4, bridge is 5/4, then back to 7/4 during the half-time part. No idea on the solo though” (TheSphericalGuy 2017).

The last two categories resemble the previous version, with the exception that in the *criticism* category there is a higher number of negative comments, perhaps attributed to the broader audience, such as: “great musicianship, incredible technique. but, where's the music? where's the soul? sorry” (Taucher 2017); and “Too smart, too happy, too self indulgent, too expensive, not for me” (Bourehim 2017). Only a handful of comments specifically discuss *performative* elements of this rendition: “Its(sic) so beautiful too(sic) see all the people in this room connected...from each musician, vocalist and audience member...transending(sic) the boundaries of race, gender and culture...bonded by the sound, magnificently so...” (Lampson 2017); with a higher number of commenters expressing their preference for the collective format over the solo format: “This collective I like much better than his solo performances. Keep this up and engage more Artists. That is keeping music LIVE and alive” (Kyd 2018).

Conclusions

JACOB COLLIER’S INTEGRITY. The spectral analysis in verse 2 of the solo version shows that Collier is constantly contributing to the mix, even if it at an imperceptible level. The technical virtuosity Collier frequently displays in his videos suggests that he does not rely on having to pretend. The deeper issue here is that his song is so densely loaded with a wide assortment of instrumental layers it becomes challenging to discern what is live and what is not. Although he is contributing, the density of the texture itself

becomes the factor that breaks the illusion and makes it appear more like what a commenter described as a “skill showcase rather than a truly engaging live performance” (Chabon 2016). This confusion is reflected in the comments (jjj13031984 2018 and lalloghin 2016), and the claim of a fabricated performance can have a damaging effect on Collier’s reputation.

The challenge of Collier’s One-Man show is compromising the complex construction of his composition with the simplicity of only one person on stage. However, simplifying or removing layers to make room for accessibility and realism on stage might limit Collier’s characteristic compositional style. While innovative in its use of technology and performance, the setup was rather complicated, and he stopped performing this show after touring with it for a few years. In an interview with Amelia Mason for the WBUR Boston NPR radio station, Collier expressed: “we pushed the one-man show pretty hard, and we felt it hit its limits at a number of points. [...] The setup worked great for audiences of 2,000, but not so much 20,000” (Mason 2018).

MEDIUM’S PERCEPTION. Despite being the same song, the change of medium from an engineered solo performance to a vibrant collective performance resulted in different perceptions from the audience. The comments show that there is an explicit shift in focus from performative elements in the solo rendition to discussions about musicians in the band version. As mentioned earlier, the hybridity in the Snarky Puppy version invites viewers to discuss their musical preferences, and the conversation is more focused on the stylistic elements of the music. On the other hand, the discussion in the solo version is geared towards compositional elements and the complexity and engineering of the work itself. This could mean that the distribution of the instrumental layers to other musicians mitigates the weight of carrying an entire band on the shoulders of a single person and suggests that the perception of complexity can be informed by the rendition. It is

important to note, however, that the performance with Snarky Puppy is deliberately less crowded, with sparser textures and few displays of mere virtuosity, which by the nature of the setup occur more frequently in the solo version.

VENUE AND VISUAL ASPECTS. The visual engagement is indispensable in the Snarky Puppy version, not only for the online viewers but for the audience at the venue. There is something powerful about observing the enthusiastic musicians passionately moving to the beat. The unique layout of the venue creates open channels of communication within the audience and the performers, and such a layout invites the listeners to imitate with their own body and engage in a collective experience. While the visual projections in the solo version can add a semiotic dimension to the performance, it can also distract and detract from the listening experience. The comments show almost no discourse about the visual elements, and although they may be a more impactful factor for the audience at the venue, it is hard to ascribe any vital value to them.

HUMAN VS. MACHINE. The principal factor that distinguishes both performances comes down to the use of either pre-recorded tracks or performers. This is a key criticism of the One-Man Show setup, and although Collier uses technology as an extension of himself, it lacks the human nuance and removes the communal experience. Ben Bloomberg himself laments the distance created by the technology, stating that:

In a lot of big shows, the technology is actually upstaging the people, because there are timers, click tracks and the humans have to stay synchronized to the tech. The musicians can't perform naturally, which is sad, because that's the most moving part – that's where the emotional connection is. (Lacey 2016).

Even reviews of the *In My Room* album point out this drawback, saying that “this album is impressive but may leave more than a few starved for something that sounds human” (Donelson 2016).

COMMUNICATION. Ultimately, one of the fundamental purposes of music is to communicate effectively with the audience. Collier's One-Man Show is a fascinating display of the symbiotic relationship between a talented musician and cutting-edge performative technology. However, by opting for a solo rendition Collier sacrifices the ability to manipulate multiple parameters of his composition in real time, weakening his communicative potential. This control of nuance is advantageously present in the Snarky Puppy version with the distribution of gestures amongst a large number of skillful musicians. Their human contribution to the different layers of the mix, in combination with the layout of the venue, make the music easier to communicate, relate, and digest. Both performances of "Don't You Know" have meaningful value to contribute, but the Snarky Puppy collaboration stands out as a more impactful interpretation due to their effective manner of communication with the audience through their controlled nuance of musical gestures.

Endnotes

- ¹ Please note that the timecodes listed in the analysis are derived from the corresponding video.
- ² Further details about the band members, guests, and recording credits are available in the description of the referenced video.
- ³ The Snarky Puppy video had 3,198,367 views and the solo version had 311,214 views by the time of this analysis, March 25th, 2019.
- ⁴ The software used was the Izotope RX 7 plugin.
- ⁵ This moment occurs between [05:42] and [05:48] of the YouTube video.
- ⁶ This was the total number of comments by the time of this analysis, March 25th, 2019.

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