

Supplemental Material

Correlating Ratings with Questionnaire Measures

We examined how our questionnaire measures correlated with the mean *liking*, *interesting*, and *unusual* ratings (i.e., regardless of tuning), as well as with tuning difference scores for each rating. For example, the tuning difference score for *liking* ratings was calculated by subtracting the mean conventionally tuned liking rating from the mean unconventionally tuned liking rating for each participant.

Correlation results are reported in Table S1. Overall, we found several intercorrelations among participant ratings and difference scores, suggesting that all three ratings had considerable overlapping variance and that the ratings, as a whole, can be taken to reflect a more general aesthetic evaluation of the pieces. Mean liking ratings were positively correlated with mean interesting ratings, and mean interesting ratings were positively correlated with mean unusual ratings. Moreover, all three tuning difference scores were positively intercorrelated. However, importantly there were no individual difference measures collected in the questionnaire that related to the tuning difference scores. All musical measures (musical training, self-reported pitch ability, self-reported musical skill) were strongly intercorrelated, but no musical measure related to excerpt ratings in any way.

Analysis of Perceptual Centroid across Recordings

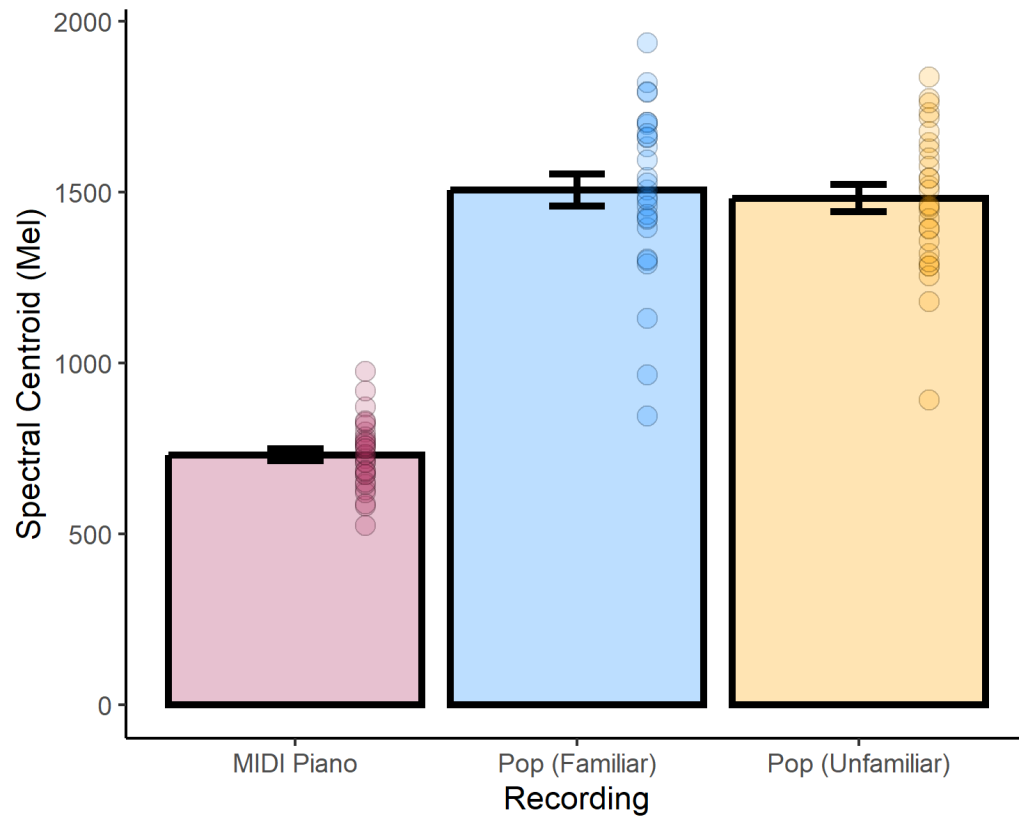
Inspired by a reviewer comment, we assessed whether the MIDI piano recordings used in Experiments 1 and 2 differed from the (un)familiar pop recordings used in Experiment 3 in terms of perceptual centroid, which is associated with perceived brightness of a sound. Perceptual centroid was calculated using the “perceptualCentroid” function in Matlab (MathWorks: Natick, MA), written by Chris Hummersone and Kirsten Hermes. Specifically, we calculated the spectral centroid of each recording (using the conventionally tuned version), with respect to mel-frequency. We only used the recordings from Experiments 2 and 3, as these were precisely matched in terms of length (5 s excerpts). Higher values thus correspond to a higher spectral centroid and increased perceptual brightness of the sound. For each recording, we calculated a single centroid value. We then compared each recording type (MIDI piano, Familiar Pop Song, Unfamiliar Pop Song) using planned Welch independent sample *t*-tests.

The results are plotted in Figure S1. The MIDI piano recordings had a mean centroid of 732 mel ($SD = 100$ mel), which was significantly lower than both the familiar pop songs ($M =$

1507 mel, $SD = 251$ mel), $t(34.85) = -15.24$, $p < .001$ and the unfamiliar pop songs ($M = 1483$ mel, $SD = 210$ mel), $t(38.00) = -17.17$, $p < .001$. The familiar and unfamiliar pop songs did not significantly differ in terms of spectral centroid, $t(52.38) = 0.39$, $p = .702$. Overall, then, these results suggest a substantial difference in terms of spectral centroid when comparing the MIDI piano recordings to the pop recordings. However, the unfamiliar and familiar pop recordings were well matched, which is perhaps not surprising as they came from the same recording artists.

Figure S1

Spectral centroid values across recording types



Note: Error bars represent plus or minus one standard error of the mean. Points represent individual recordings within each group.

Table S1

Correlation Results from Experiment 1

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Liking Rating	-										
2. Interest. Rating (7.10e5)	.545***	-									
3. Unusual Rating (0.19)	.089	.218*	-								
4. Liking Diff. (0.15)	.056	.628***	-.021	-							
5. Interest. Diff. (0.16)	.064	.789***	.036	.812***	-						
6. Unusual Diff. (0.26)	-.123	.257*	-.122	.234*	.446***	-					
7. Age (0.27)	.129	.073	.209*	-.065	.018	.034	-				
8. Edu. (0.15)	-.050	-.093	-.013	-.095	-.062	.008	.131	-			
9. Music Skill (0.13)	.024	-.057	-.019	.004	-.094	.029	-.048	.066	-		
10. Music Training (0.13)	-.016	-.068	.182	-.043	-.152	-.020	-.016	.010	.593***	-	
11. Pitch Perception (0.26)	.126	.090	-.078	.158	.095	.109	.106	-.043	.503***	.369***	-

Note: Values represent Pearson correlation coefficients. Bayes Factors are printed below in parentheses. Interest. = Interesting; Diff. = Intonation Difference Score; Edu. = Education; * $p < .05$ ** $p < .01$ *** $p < .001$

Table S2

List of pieces used in Experiments 1 and 2

Number	Artist	Work Title (Year)	Piece Title
01	Friedrich Burgmüller	18 Etudes, Op. 109 (1858)	The Pearls
02	Friedrich Burgmüller	18 Etudes, Op. 109 (1858)	The Fountain
03	Friedrich Burgmüller	18 Etudes, Op. 109 (1858)	Agitato
04	Friedrich Burgmüller	18 Etudes, Op. 109 (1858)	Velocity
05	Friedrich Burgmüller	18 Etudes, Op. 109 (1858)	Awakening in the Woods
06	Friedrich Burgmüller	18 Etudes, Op. 109 (1858)	Thunderstorm
07	Friedrich Burgmüller	18 Etudes, Op. 109 (1858)	The Sylphs
08	Friedrich Burgmüller	18 Etudes, Op. 109 (1858)	Separation
09	Friedrich Burgmüller	18 Etudes, Op. 109 (1858)	The Spinning Song
10	Alexander Borodin	Petite Suite (1885)	In the Monastery
11	Alexander Borodin	Petite Suite (1885)	Intermezzo
12	Alexander Borodin	Petite Suite (1885)	Mazurka (Allegro)
13	Alexander Borodin	Petite Suite (1885)	Mazurka (Allegretto)
14	Alexander Borodin	Petite Suite (1885)	Reverie
15	Alexander Borodin	Petite Suite (1885)	Serenade
16	Alexander Borodin	Petite Suite (1885)	Nocturne
17	Isaac Albéniz	España, Op. 165 (1890)	Prelude
18	Isaac Albéniz	España, Op. 165 (1890)	Tango
19	Isaac Albéniz	España, Op. 165 (1890)	Malagueña
20	Isaac Albéniz	España, Op. 165 (1890)	Serenata
21	Isaac Albéniz	España, Op. 165 (1890)	Capricho Catalan
22	Isaac Albéniz	España, Op. 165 (1890)	Zortzico
23	Isaac Albéniz	Suite española (1886)	Granada
24	Isaac Albéniz	Suite española (1886)	Cataluña (Curranda)
25	Isaac Albéniz	Suite española (1886)	Sevilla
26	Isaac Albéniz	Suite española (1886)	Cádiz (Saeta)
27	Isaac Albéniz	Suite española (1886)	Asturias (Leyenda)
28	Isaac Albéniz	Suite española (1886)	Aragon (Fantasia)
29	Isaac Albéniz	Suite española (1886)	Castilla (Seguidillas)
30	Isaac Albéniz	Suite española (1886)	Cuba (Notturmo)

Table S3

List of recordings used in Experiment 3

Number	Artist (or Featured Artist)	Familiar Song Title	Unfamiliar Song Title
01	Beyonce	Single Ladies	Nothing Out There For Me
02	Rihanna	Umbrella	Higher
03	Taylor Swift	Shake It Off	The Outside
04	Britney Spears	Toxic	Anticipating
05	Adele	Rolling in the Deep	Love in the Dark
06	Katy Perry	Firework	Into Me You See
07	The Weeknd	Blinding Lights	Losers
08	Outkast	Hey Ya	When I Look In Your Eyes
09	Shakira	Hips Don't Lie	Men In This Town
10	Justin Timberlake	Sexy Back	Nothing Else
11	Carly Rae Jepsen	Call Me Maybe	Money and the Ego
12	Bruno Mars	Uptown Funk	Straight Up & Down
13	Lady Gaga	Poker Face	No Floods
14	Nicki Minaj	Starships	Want Some More
15	Lorde	Royals	Still Sane
16	Miley Cyrus	Party in the USA	You and Me Together
17	Billie Eilish	Bad Guy	Party Favor
18	Daft Punk	Get Lucky	Drive
19	Pharrell Williams	Happy	Best Friend
20	Luis Fonsi	Despacito	Nuestra Balada
21	Psy	Gangnam Style	Lady
22	a-ha	Take On Me	Sycamore Leaves
23	Guns 'N Roses	Sweet Child O Mine	Human Being
24	John Lennon	Imagine	#9 Dream
25	Queen	We Are The Champions	Great King Rat
26	Nirvana	Smells Like Teen Spirit	Scoff
27	Gotye	Somebody That I Used to Know	Noir Excursion
28	Don McLean	American Pie	Fool's Paradise

Note: Participants would hear either the familiar songs or unfamiliar songs only depending on condition