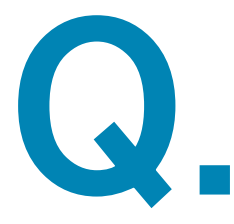# Unveiling the Impact of Musical Factors in Judging a Song on First Listen: Insights from a User Survey

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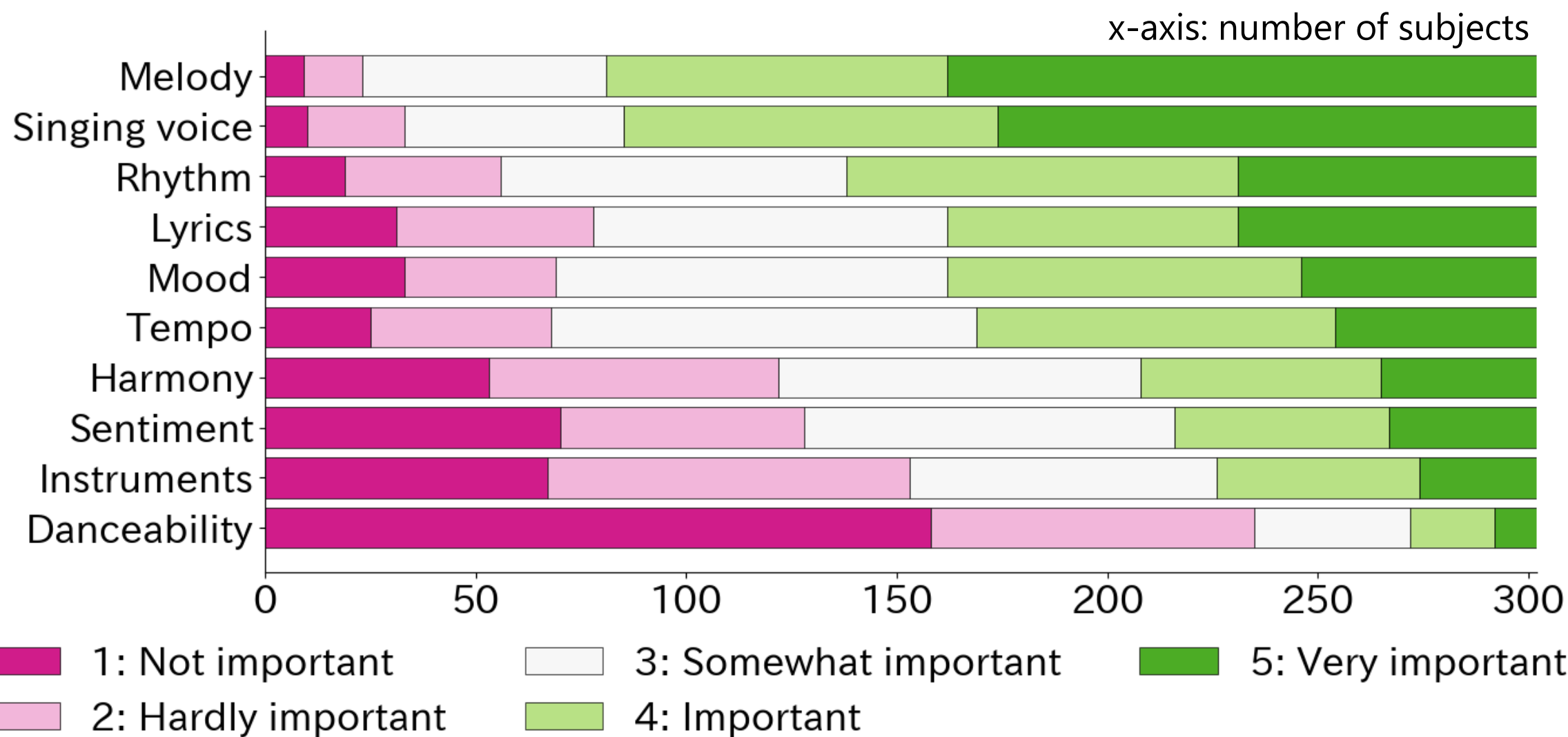
Q. When a user listens to a song **for the first time**, **what musical factors** influence the user's decision to like or dislike the song, and **to what extent**?

- Answer this question by conducting an online user survey with 302 subjects
- Publicly available survey results on GitHub:

1. Importance distributions of musical factors / criteria for liking or disliking a song

x-axis: number of subjects

- 1: Not important
- 2: Hardly important
- 3: Somewhat important
- 4: Important
- 5: Very important

Factor	Top criterion for "like"	Top criterion for "dislike"
Melody	Easy to remember	Too loud
Singing voice	Specific type (beautiful, soft)	Feels uncomfortable
Rhythm	Groovy	Rhythm not to my liking
Lyrics	Sympathetic	Unclear meaning
Mood	Cheerful	Gloomy
Tempo	Fast	Slow
Harmony	Feels comfortable	Feels uncomfortable
Sentiment	Positive	Negative
Instruments	Include specific instruments	Too loud
Danceability	Body moves naturally to music	Not groovy

Melody and singing voice are significantly more important than others

The criteria can be applied to explainable recommendation

2. Influence of personality traits measured by Big Five Inventory (BFI)

Spearman's rank correlations between personality traits and musical factor importance (N=302)

Trait	Melody	Singing voice	Rhythm	Lyrics	Mood	Tempo	Harmony	Sentiment	Instruments	Danceability
Openness	**0.127***	**0.135***	**0.155****	**0.177****	0.107	0.109	**0.255*****	0.050	**0.157****	**0.151****
Conscientiousness	0.076	**0.128***	0.062	0.031	**0.127***	**0.128***	**0.125***	**0.119***	0.028	0.013
Extraversion	0.062	**0.130***	**0.172****	**0.175****	0.098	**0.114***	**0.254*****	0.107	**0.151****	**0.219*****
Agreeableness	0.025	**0.123***	0.048	0.088	**0.158****	0.029	0.021	0.060	0.049	0.065
Neuroticism	0.003	0.010	-0.081	0.036	-0.025	-0.004	**-0.142***	0.109	-0.072	**-0.120***

- People with high openness have more diverse criteria for judging whether a song fits their taste
- Recommend songs based on the relationships between genres and traits, without explicitly asking factor importance

3. Influence of musical sophistication (e.g., dance experience and frequency of karaoke)

Spearman's rank correlations between musical sophistication and musical factor importance (N=302)

Sophistication	Melody	Singing voice	Rhythm	Lyrics	Mood	Tempo	Harmony	Sentiment	Instruments	Danceability
InstrumentExp	0.100	0.061	-0.019	0.108	0.037	-0.099	**0.134***	0.093	0.091	0.101
DanceExp	-0.041	0.039	-0.047	**0.126***	0.030	-0.024	0.044	0.098	-0.005	**0.341*****
NoticeBeat	**0.228*****	**0.228*****	**0.126***	0.082	0.107	0.073	**0.302*****	**0.205*****	**0.147***	0.072
NoticeTune	**0.272*****	**0.231*****	0.099	0.088	**0.121***	0.039	**0.276*****	**0.167****	0.078	0.001
ListenMusic	0.041	0.054	0.111	**0.141***	**0.135***	0.101	0.078	0.108	0.051	0.090
ListenNew	0.003	0.107	**0.152****	**0.152****	0.112	**0.194*****	**0.115***	0.101	**0.126***	**0.169****
ViewLyrics	0.001	0.085	**0.118***	**0.243*****	**0.120***	**0.147***	**0.136***	**0.128***	0.101	0.110
Karaoke	0.085	0.087	0.005	**0.210*****	**0.154****	-0.015	0.057	**0.129***	-0.033	0.081
AttendEvent	-0.038	0.037	-0.023	**0.200*****	0.004	0.016	0.039	-0.005	0.088	**0.179****

- Not only obvious results but also unexpected results (e.g., between ListenNew and lyrics, and between ListenNew and danceability)
- On a music streaming service, the importance of each factor to a user can be estimated from ListenMusic, ListenNew, and ViewLyrics

4. Possible functions on music streaming services based on musical factors

Registration of factor importance

	Not important	Hardly important	Somewhat important	Important	Very important
Melody	○	○	●	○	○
Rhythm	○	○	○	○	○
Lyrics	○	○	○	○	●
⋮					
Tempo	○	●	○	○	○

When a user listens to a song, the service can recommend songs that have various tempos and similar lyrics to the song

Evaluation of songs by factors

YOUR evaluations

Angel Baby / Betty

- Lyrics ★★★★☆ 4
- Melody ★★☆☆☆ 2
- ⋮
- Mood ☆☆☆☆☆ -
- Danceability ★★★☆ 4

EVERYONE'S evaluations

Angel Baby / Betty

- Lyrics ★★★☆☆ 2.7
- Melody ★★★★☆ 4.3
- ⋮
- Mood ★★★☆☆ 3.1
- Danceability ★★★★☆ 4.5

If danceability is an important factor for a user, songs by "Betty" can be sorted and displayed in order of the averaged ratings for danceability

Presentation of factor information

SHAKE / MAPS

| Lyrics | Eternal love | Sentiment | Positive |
| Instruments | Piano | Danceability | 1.3 / 5 |
⋮
| Singing voice | Female | Tempo | 80 BPM |

If a user prefers slow-tempo songs with piano, she can efficiently check newly released songs