

Lullabies and Playsongs in a Cross-Linguistic Perspective

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Research Question

- Are infant-directed songs (IDSong) similar across languages? Which musical features determine an IDSong?
- Is there an influence of the social and emotional context? (Playsong vs Lullaby)?

Introduction

infant-directed speech (IDSpeech) is a universal component of human communication (e.g. Bryant & Barrett, 2007)

expressed with similar prosodic features in all languages of the world (e.g. Fernald et al., 1989)

- higher f0
- wider pitch range
- shorter utterances
- exaggerated marking of phrase boundaries

Infant-directed music also found in nearly every culture of the world parents singing to their infants in soothing or playful contexts (IDSong) IDSong can easily be identified by adults, regardless of cultural background of the song (Unyk et al., 1992)

Falk, S. (2011)
tonal contour comparison in three languages of IDSpeech vs IDSong
crosslinguistic commonalities in speech, less in song

→ **not clear which musical features make a song infant directed and whether there are cross-linguistic commonalities in IDSong, similar to IDSpeech**

Patel et al. (2006)
comparison of 318 musical themes from french and english composers
rhythmical differences (nPVI) found, dependent on linguistic background of composer

Hannon (2008)
listeners from various countries can identify origin of a song (frensh vs. english) based on musical information only

→ **Linguistic features are evident in Music**
→ **IDSongs might carry inherent features of their linguistic origin**

Method

comparison of German Lullabies (n = 42) vs German Play Songs (n = 61)
→ **role of social context?**

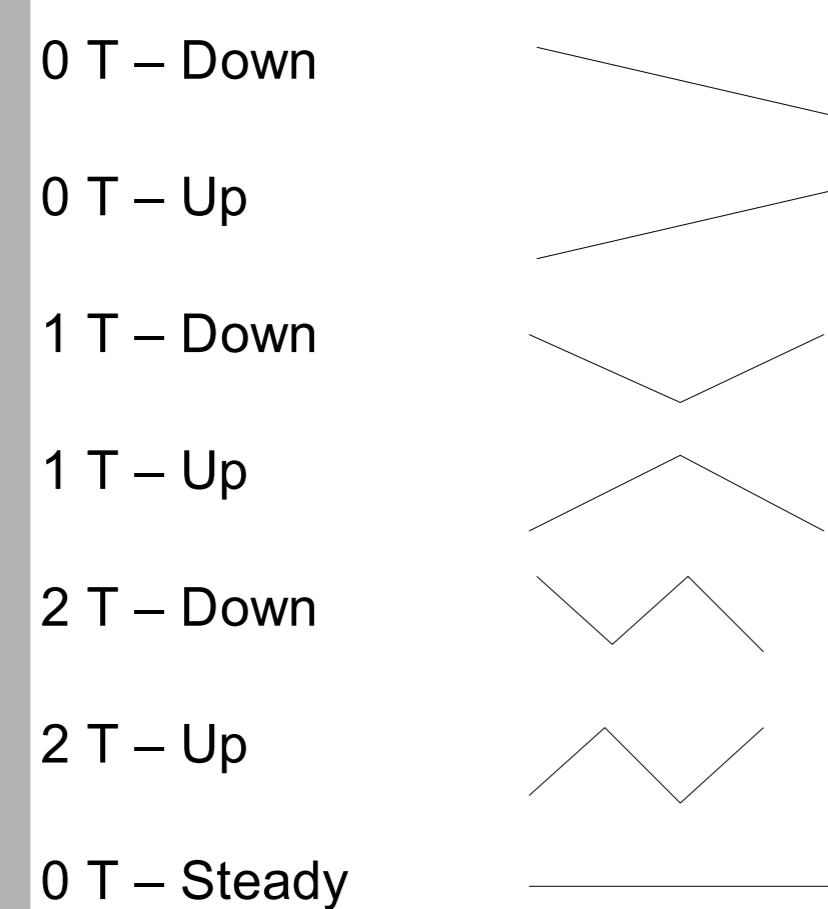
comparison of German Lullabies and Japanese Lullabies (n = 33)
→ **role of stress class (mora vs stress timed)?**

songs have been obtained in midi format from song books, internet by native speaker of respective language
only included when considered as typical candidate of category playsong/lullaby
part of Japanese collection taken from Kurioshi & Kajikawa (1996)

midis have been transposed to c-major and segmented into phrases in alignment to text – one linguistic phrase considered as one musical phrase

Analysis: MATLAB with midtoolbox (Eerola & Toivainen, 2004)

Contour Types
relative to amount of turning points (T) and turn direction (Up / Down)
difference of min 1 semitone = 1 T



Results

	German Lullabies	Japanese Lullabies	German Play Songs
songlength in tones	49,85 (2,82)	53,48 (5,71)	41,50 (2,08)
no of segments	6,10 (0,35)	5,45 (0,71)	5,54 (0,25)
avLg of segments	8,20 (0,31)	9,78 (0,69)	7,72 (0,27)
sdLg of segments	2,75 (0,29)	1,99 (0,34)	1,88 (0,16)
ambitus (range in semitones)	12,05 (0,42)	11,97 (0,43)	11,36 (0,37)
notedensity_sec	2,02 (0,10)	2,13 (0,11)	2,09 (0,10)
nPVI*	35,61 (2,37)	39,74 (3,75)	25,35 (1,62)

- songs are never longer than 60 tones
- phrases consist of 5 tones mostly
- tonal range is mostly within 1 octave

→ songs differ in terms of rhythm (nPVI)
→ Lullabies from Germany (GL)+Japan(JL) built one group
→ Play Songs (GL) rather low nPVI

keymode: only 7 of 136 songs in minor key, all GP in major key

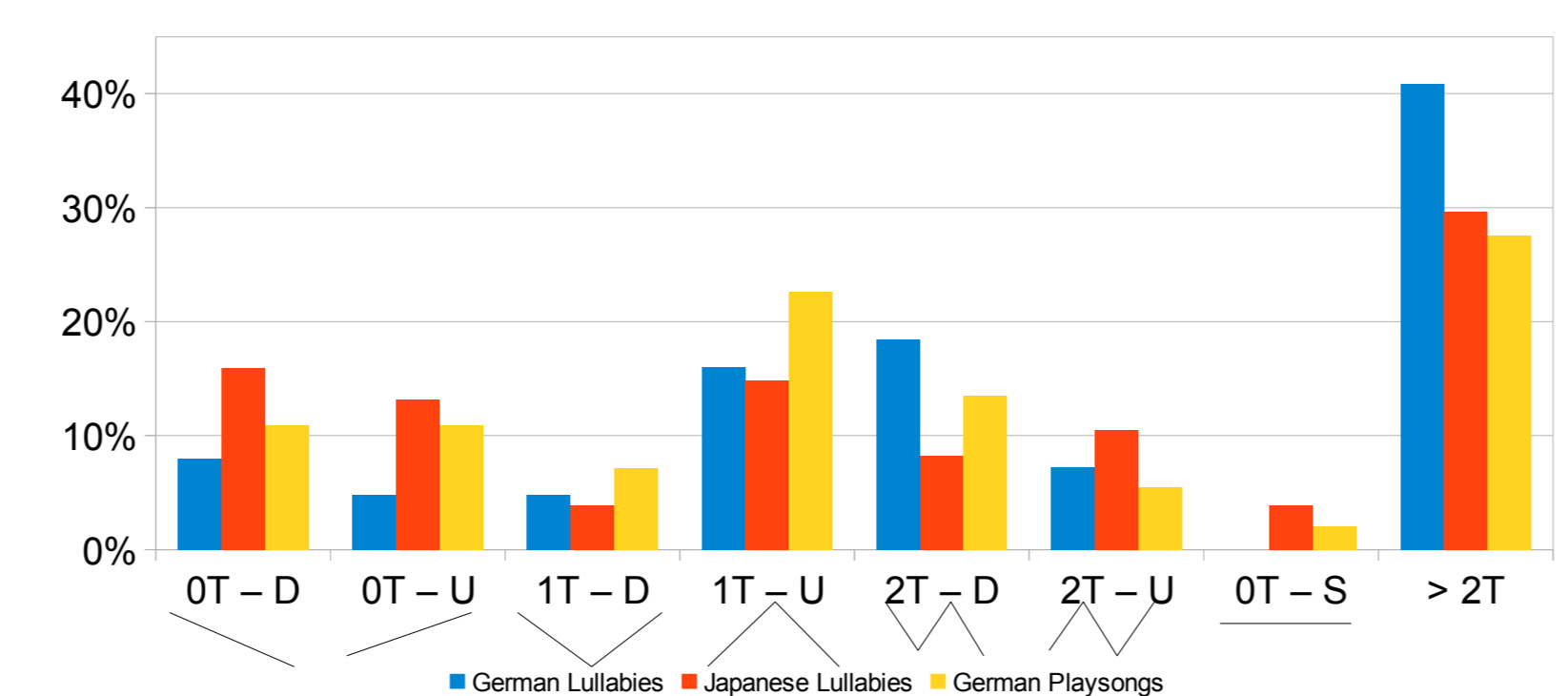
*nPVI: numeric pairwise variability index the higher the more variability between succeeding rhythmic events

Meter	German Lullabies	Japanese Lullabies	German Play Songs	Σ
2/2	0	0	1	1
2/4	8	7	21	36
3/4	9	4	12	25
3/8	2	0	2	4
4/4	14	21	15	50
5/4	0	0	1	1
6/8	7	0	4	11
9/8	1	0	0	1
Total	41	32	56	130

German Lullabies and Playsongs high variability in meter

Japanese Lullabies mostly quarter beat

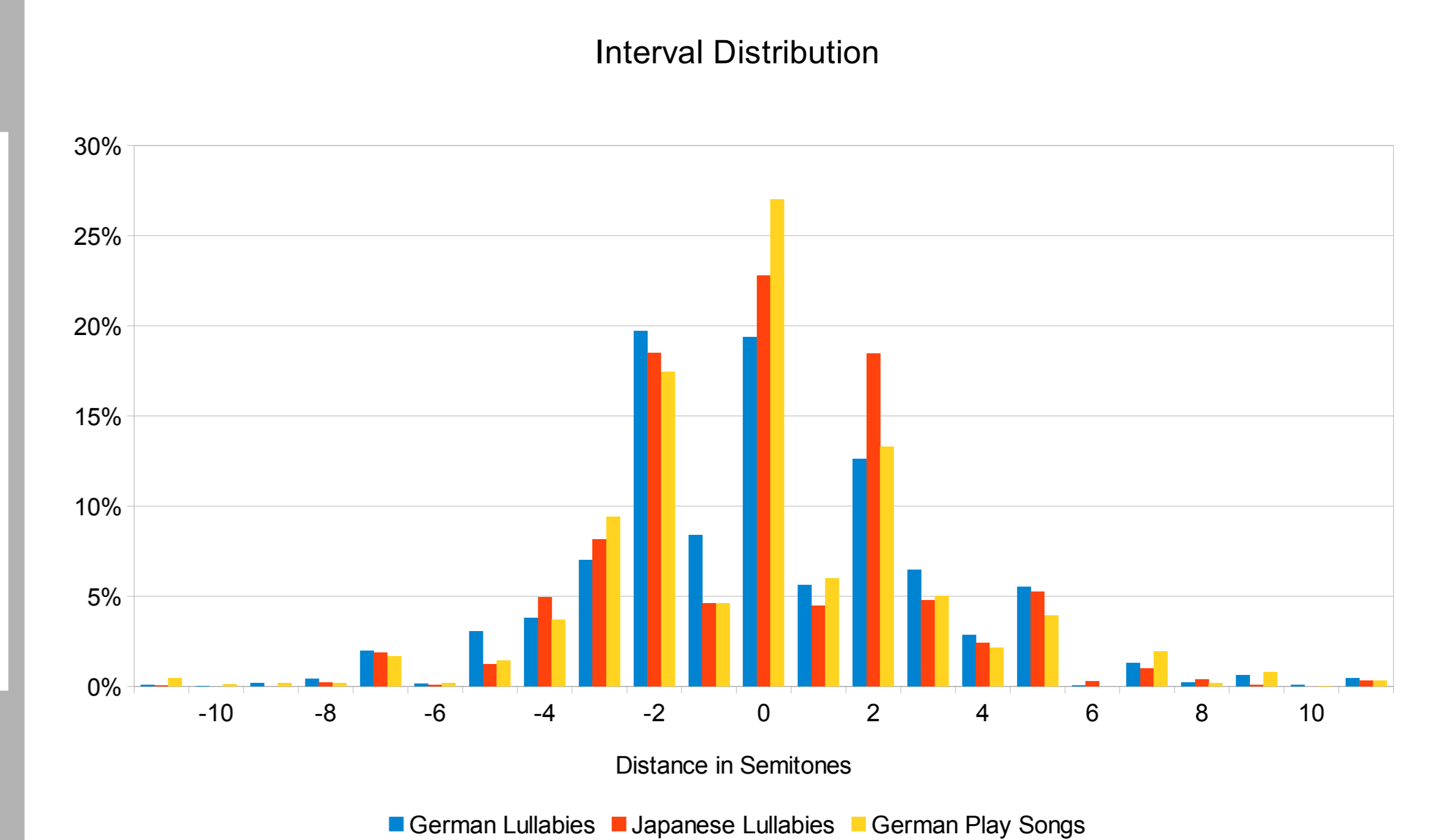
Proportion of contour types



GL 40% of songs more than 2 turning points – eventually confound from melodic ornamentation (1 semitone up / down)

turning points occur towards end of phrase in all three groups

GP contour seems to be very frequent

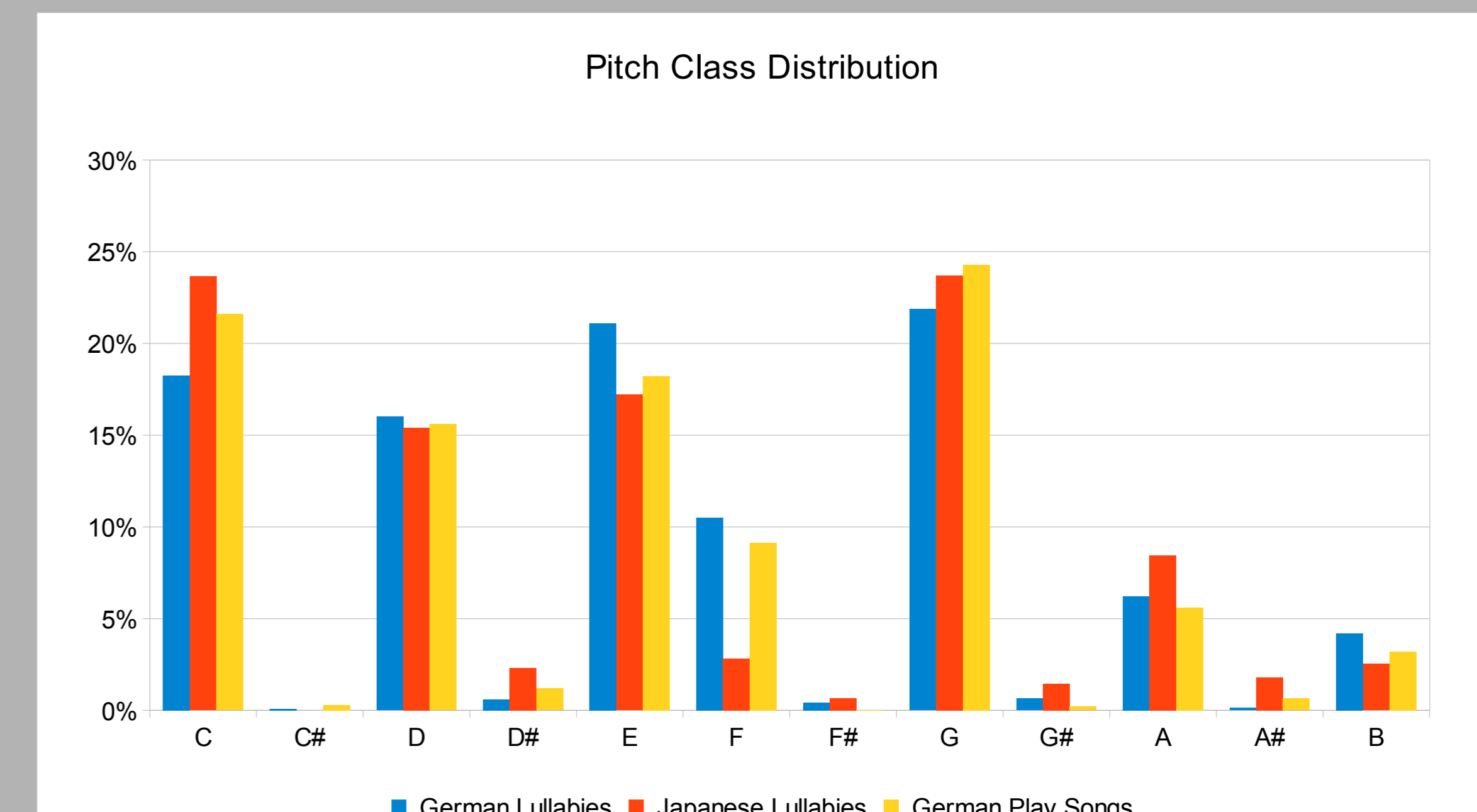


GP many tone repetitions (0 semitones)

JL upward mj second very frequent (+2 semitones)

GP + GL mj second (+/- 2 semitones) upward and downward evenly distributed

GL more downward mn seconds (-1 semitone)



tonic (C) and dominant (G) play crucial role

tonic especially frequent in JL

D (mj second) and E (mj third) very close to tonik – reflect high amount of small intervals in songs

F (fourth) leads to dominant in european music – reflected in GP and GL not represented in JL

Discussion

commonalities in most features between all three groups - extension of results from Falk (2011)

nPVI and turning point analysis seem to be most promising perspectives for further investigation

nPVI similar in lullabies betw languages, differs dependent of social context
→ effect of lullaby works regardless of mother tongue

Turningpoints occur toward end of musical phrase → salient mark for phrase boundaries, similar to prosodic marking of boundaries in language?

melodies reflect harmonic scaffold of western tonal music

- frequent occurrence of tonic and dominant
- small intervalls group around tonic

role of musical background
pattern in western tonal music:subdominant leads to dominant – not represented in japanese lullabies

role of social context
GL have more complex contours and rhythms (nPVI) than playsongs

- lullabies play with music, playsongs play with language?
- more onomatopoeia, play of words in play songs → supports acquisition of eg. phonotactic/morphologic linguistic information
- more contour changes, rhythmic variability in lullabies → supports acquisition of suprasegmental linguistic information, e.g.prosodic boundaries

Further research questions

Comparison of IDSong to nonIDSong
→ Which criteria distinguish musif for children from music for adults?

Comparison of IDSong to IDSpeech
→ IDSong might support language acquisition (boundary marking, phonetic classes)

Influence of speech prosody on songs → further investigate contours and nPVI of IDSpeech from German and Japan

Does child age affect quality of song?
role of joint attention increases
role of emotional bonding/soothing decreases
communicative intentions become more complex

refine turning point analysis – change of 1 semitone not regarded as turning point, rather as ornament

investigate amount of repetition across melodic phrases
are patterns repeated in transposed / changed version?

role of text in childsongs → are important stressed via musical features?

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