Musical Pitch is Not "High" or "Low"

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INTRODUCTION

In much of the Western world pitches are conceived of as existing in a metaphorical 2-dimensional space along a vertical axis where “high frequency”[1] pitches lie higher and “low frequency” pitches are lower. but this isn’t a universal phenomenon. In some cultures, and even for some children in the Western world, this orientation is reversed.[2]

In many parts of the world, pitches exist in other metaphorical spaces (e.g. thick/thin; big/small); metaphorical spaces related to mass (e.g. heavy/light); metaphorical kinship relations (e.g. grandmother/daughter), age metaphors (e.g. old voices/young voices); or very culturally specific senses (e.g. crocodile/those who follow crocodile).

This is a non-exhaustive list of many of these pitch metaphors with relevant references to help those who are curious get a sense of the global diversity of pitch metaphors throughout time. As with many of the other resources by the author at *Mae Mai*, the *r/GlobalMusicTheory wiki*, and other publicly available online spaces, this is a work in progress and updated versions can be found linked here or via this DOI: 10.6084/m9.figshare.24002442.

ENTRIES

Ancient Greek Music (EU: Greece)
- H - *oxys* (“sharp”)[3]
- L - *barys* (“heavy”)[4]

'Are'are (OC: Malaita, Solomon Islands)
- H - *siho* (“to go down”); *hi hu’a* (“towards the bottom”)[5]
- L - *hane* (“to go up”); *hi uuru* (“towards the top”)[6]

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[1] It should be noted that “high” and “low” as they relate to frequency are themselves also metaphorical usages.
[2] See entries on the *‘Are’are* and *Dutch children*, for example.
[3] Eitan & Timmers (2010: 406)
[4] Eitan & Timmers (2010: 406)
[5] Zemp & Malkus (1979: 14-15)
[6] Zemp & Malkus (1979: 14-15)

Bashi (AF: Democratic Republic of Congo)
- H - *mulEŋgi musuŋgono*[7] ("small" or "weak" notes)[8]
- L - *mulEŋgi munEni*[9] ("big" or "strong" notes)[10]

Basongye (AF: Republic of Congo)
- H - *lupela* ("small")[11]
- L - *lukata* ("large")[12]

China
- H - *qing* 清 ("clear")[13]; *ruo* 弱 ("weak"); *qing* 輕 ("light"); *duan* 短 ("short")[14]; "child's sound"[15]
- L - *zhuo* 濁 ("muddy")[16]; *qiang* 強 ("strong"); *zhong* 重 ("heavy"); *chang* 長 ("long")[17]; "adult's sound"[18]

Chopi (AF: Mozambique)
- H - small or weak note[19]
- L - big or strong note[20]

Croatian (EU: Croatia, parts of Eastern Europe)
- H - *sitan glas* ("tiny voice"); *sitni veskovi* ("tiny sounds"); *brzi treptaji* ("quick oscillations")[21]
- L - *krupan glas* ("big voice"); *krupni veskovi* ("big sounds"); *polagani treptaji* ("slow oscillations")[22]

Dan (AF: Northwestern Ivory Coast, Liberia)
- H - small voice[23]
- L - large voice[24]

Dutch children (EU: Netherlands)
- H - "Our results suggest 5-year-olds understand height-pitch metaphors in a reversed fashion (high pitch = low)"[25]

Dutch infants (EU: Netherlands)
- 4 month old Dutch infants are just as likely to prefer thickness-pitch mappings as they are height-pitch mappings.[26]

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[7] Merriam (1957: 144)
[8] Eitan & Timmers (2010: 406); Merriam (1957: 144); Merriam (1964: 94)
[9] Merriam (1957: 144)
[10] Eitan & Timmers (2010: 406); Merriam (1957: 144); Merriam (1964: 96)
[11] Merriam (1964: 97)
[12] Merriam (1964: 97)
[13] Needham & Robinson (1962: 157, 203-204); Christensen (2019: 194)
[14] Christensen (2019: 194)
[15] Christensen (2019: 197)
[16] Needham & Robinson (1962: 157, 203-204); Christensen (2019: 194)
[17] Christensen (2019: 194)
[18] Christensen (2019: 197)
[19] Tracey (1948: 107)
[20] Tracey (1948: 107)
[21] Žuvela & Anić (2019: 209-210)
[22] Žuvela & Anić (2019: 209-210)
[23] Stone (1981: 190)
[24] Stone (1981: 190)
[25] Dolscheid (2015)
[26] Dolscheid et al. (2014)

Farsi (AS: Iran)

- H - *naazok* (“thin”)
- L - *koloft* (“thick”)

Gbaya xylophone (AF: Central African Republic)

- L to H - grandmother, mother, father, son and daughter[27]

Horizontal-Pitch mapping (see also *Right-handed subjects*)

- H - right[28]
- L - left[29]

Infants (see also *Dutch infants*; relatedly, see also *Dutch Children*, and *Italian Children*)

- 3 to 4-month old Infants are just as likely to prefer sharpness-pitch mappings as they are height-pitch mappings.[30]

Istria (EU: Peninsular Croatia/Slovenia/Italy)

- H - *kanat na tanko* (“singing thin”); *mala sopela* (“small sopela”)[31]
- L - *kanat na debelo* (“singing thick”); *velika sopela* (“big sopela”)[32]

Italian children

- Correspondence of pitch and vertical alignment metaphors not fully developed in 4-5 year old children: “[O]ur study showed that preschool children were sensitive to audio-visual, visuo-tactile and audio-tactile correspondences, but only under specific experimental conditions, suggesting that an adult-like sensitivity to these correspondences is still developing by age five years.”[33]

Jabo (AF: Southeastern Liberia)

- H - *ke* (small voice; name of a bird with a high-pitched voice)[34]
- L - *dolo* (large voice; name of a bird with a low-pitched voice)[35]

Kpelle (AF: Central Liberia; Guinea)

- H - *wóo su kuro têi* (small voice; lit. “voice with a small inside”)[36]; “light”[37]
- L - *wóo su kéte* (large voice; lit. “voice with a large inside”)[38]; “heavy”[39]
- M - *sáma*[40] (middle voice)

Kreung (AS: Northeast Cambodia)

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[27] Ashley (2004: 66-67); Eitan & Timmers (2010: 406)
[28] See Timmers & Li (2016) for a review of the literature; Rusconi et al. (2006) shows preference for left-right/low-high mappings in non-musicians on pitch related tasks while the preference in trained musicians is for this mapping in both pitch and non-pitch related tasks; Lidji et al. (2007)
[29] See Timmers & Li (2016) for a review of the literature; Rusconi et al. (2006) shows preference for left-right/low-high mappings in non-musicians on music related tasks while the preference in trained musicians is for this mapping in both music and non-music related tasks; Lidji et al. (2007)
[30] Walker, et al. (2010)
[31] Žuvela & Anić (2019: 210)
[32] Žuvela & Anić (2019: 210)
[33] Nava et al. (2016: 109); See also Lewkowicz & Minar (2014) for research suggesting the same for American infants.
[34] Stone (1981: 190)
[35] Stone (1981: 190)
[36] Stone (1981: 190)
[37] Eitan & Timmers (2010: 406)
[38] Stone (1981: 190)
[39] Eitan & Timmers (2010: 406)
[40] Stone (1981: 190)

- H - “tight”[41]
- L - “loose”[42]

Latin (EU: up to late Middle Ages Europe)

- H - *acutus* (“sharp”)
- L - *gravis* (“heavy”)

Lau (OC: Solomon Islands)

- H - *kwao* (“white”; charcoal marks on a plank, light up-strokes)[43]
- L - *bulu* (“black”; charcoal marks on a plank, heavy down-strokes)[44]

Right-handed subjects

- H - right[45]
- L - Left[46]

Shona mbira (AF: Zimbabwe)

- H - “those who follow crocodile”; ‘‘mad person”; “young men’s voices”; ‘‘women’s voices”; “thick”[47]
- L - “crocodile”; ‘‘stable (person) who holds the piece together”; ‘‘old men’s voices”; ‘‘men’s voices”; “thin”[48]

Suyá (SA: Amazonian basin)

- H - (“young”)[49]
- L - (“old”)[50]

Turkish (AS: Western Asia, Asia Minor)

- H - “thin”
- L - “thick”

Zapotec (NA: Sierra Sur of Mexico)

- H - “thin”
- L - “thick”

REFERENCES

Antović, Mihailo. (2009). Musical Metaphors in Serbian and Romani Children: An Empirical Study. *Metaphor and Symbol, 24*(3): 184-202. DOI: 10.1080/10926480903028136.

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[41] Parkinson et al (2012)
[42] Parkinson et al (2012)
[43] Ivens (n.d.: 98)
[44] Ivens (n.d.: 98)
[45] Deutsch (1975); Deutsch (1983); Deutsch et al. (2007)
[46] Deutsch (1975); Deutsch (1983); Deutsch et al. (2007)
[47] Eitan & Timmers (2010: 406)
[48] Eitan & Timmers (2010: 406)
[49] Eitan & Timmers (2010: 406)
[50] Eitan & Timmers (2010: 406)

Ashley, Richard. (2004). Musical Pitch Space Across Modalities: Spatial and Other Mappings Through Language and Culture. In P. W. S. Lipscomb, R. Ashley, & R. Gjerdingen (Eds.), *Proceedings of the 8th International Conference on Music Perception and Cognition* (pp. 64-71). Adelaide, Australia: Causal Productions.

Brower, Candace. (2008). Paradoxes of Pitch Space. *Music Analysis*, *27*(1): 51-106. http://www.jstor.org/stable/25171406.

Christensen, Lars. (2019, June). *The Time-Suturing Technologies of Northern Song Musicology* [Ph.D. dissertation: University of Minnesota]. University of Minnesota Digital Conservancy. https://hdl.handle.net/11299/206308.

Christensen, Peer & Marianne Gullberg. (2016, September). *Musical Pitch Metaphors in Speech and Gesture: Evidence from Swedish and Turkish* [Poster presentation]. Presented at Perception Metaphor Workshop, MPI for Psycholinguistics, Nijmegen. Abstract: https://peerchristensen.netlify.app/publication/nijmegenposter.

Christensen, Peer & Marianne Gullberg. (2018, July 4). *Bimodal Musical Pitch Metaphors in Swedish and Turkish: When Speech and Gesture Both Converge and Diverge* [Presentation]. 8th Conference of the International Society for Gesture Studies (ISGS8), Cape Town, South Africa. Abstract: https://peerchristensen.netlify.app/talk/isgs8.

Costa-Giomi, Eugenia, & Valerie Descombes. (1996). Pitch Labels with Single and Multiple Meanings: A Study with French-Speaking Children. *Journal of Research in Music Education*, *44*(3): 204-214. DOI: 10.2307/3345594.

Deutsch, Diana. (1975). Two-channel Listening to Musical Scales. *The Journal of the Acoustical Society of America, 57*(5): 1156-1160. DOI: 10.1121/1.380573.

Deutsch, Diana. (1983, September 1). Auditory Illusions, Handedness, and the Spatial Environment. *Journal of the Audio Engineering Society, 31*(9), 606-620. https://www.researchgate.net/publication/292825591_AUDITORY_ILLUSIONS_HANDEDNESS_AND_THE_SPATIAL_ENVIRONMENT.

Deutsch, Diana, Kamil Hamaoui, & Trevor Henthorn. (2007). The Glissando Illusion and Handedness. *Neuropsychologia, 45*(13): 2981-2988. DOI: j.neuropsychologia.2007.05.015.

Dolscheid, Sarah, Simge Çelikb, Hasan Erkanc, Aylin Küntayd, & Asifa Majid. (2020, March). Space-Pitch Associations Differ in Their Susceptibility to Language. *Cognition, 196*(-). DOI: 10.1016/j.cognition.2019.104073.

Dolscheid, Sarah, Sabine Hunnius, & Asifa Majid. (2015). When High Pitches Sound Low: Children's Acquisition of Space-Pitch Metaphors. In D. C. Noelle, R. Dale, A. S. Warlaumont, J. Yoshimi, T. Matlock, C. D. Jennings, et al. (Eds.), *Proceedings of the 37th Annual Meeting of the Cognitive Science Society (CogSci 2015)* (pp. 584-598). Austin, TX: Cognitive Science Society. https://mindmodeling.org/cogsci2015/papers/0109/index.html.

Dolscheid, Sarah, Sabine Hunnius, Dan Casasanto, & Asifa Majid. (2014). Prelinguistic Infants Are Sensitive to Space-Pitch Associations Found Across Cultures. *Psychological Science*, *25*(6): 1256–1261. http://www.jstor.org/stable/24543515.

Dolscheid, Sarah, Shakila Shayan, Asifa Majid, & Daniel Casasanto. (2013, March 28). The Thickness of Musical Pitch: Psychophysical Evidence for Linguistic Relativity. *Psychological Science, 24*(5): 613-621. DOI: 10.1177/0956797612457374.

Dolscheid, Sarah, Shakila Shayan, Ozge Ozturk, Asifa Majid, & Daniel Casasanto. (2010). *Language Shapes Mental Representations of Musical Pitch: Implications for Metaphorical Language Processing* [Abstract]. In Proceedings of the 16th Annual Conference on Architectures and Mechanisms for Language Processing [AMLaP 2010] (pp. 137). York: University of York.

Eitan, Zohar & Renee Timmers. (2010, March). Beethoven's Last Piano Sonata and Those Who Follow Crocodiles: Cross-Domain Mappings of Auditory Pitch in a Musical Context. Cognition 114(3): 405-422. DOI: 10.1016/j.cognition.2009.10.013.

Holler, Judith, Linda Drijvers, Afrooz Rafiee & Asifa Majid. (2022, February), Embodied Space-pitch Associations are Shaped by Language. *Cognitive Science, 46*(2): e13083. DOI: 10.1111/cogs.13083.

Ivens, Walter G. (n.d.). *The island builders of the Pacific*. Philadelphia: J. 13. Lippincott.

Karpinski, Gary S. (2012). Ambiguity: Another Listen [Online]. *Music Theory Online, 18*(3). https://mtosmt.org/issues/mto.12.18.3/mto.12.18.3.karpinski.html.

Lewkowicz, David J., & Nicholas J. Minar. (2014). Infants Are Not Sensitive to Synesthetic Cross-Modality Correspondences: A Comment on Walker et al. (2010). *Psychological Science, 25*(3): 832-834. DOI: 10.1177/0956797613516011.

Lidji Pascale, Régine Kolinsky, Aliette Lochy, & José Morais. (2007, October). Spatial associations for musical stimuli: a piano in the head? *Journal of Experimental Psychology: Human Perception and Performance, 33*(5): 1189-207. DOI: 10.1037/0096-1523.33.5.1189. PMID: 17924817.

Merriam, Alan P. (1957). The Bashi Mulizi and Its Music: An End-Blown Flute from the Belgian Congo. *The Journal of American Folklore*, *70*(276): 143-156. DOI: 10.2307/537298.

Merriam, Alan P. (1964). *The Anthropology of Music*. Evanston, IL: Northwestern University press.

Nava, Elena, Massimo Grassi & Chiara Turati. (2016). Audio-Visual, Visuo-Tactile and Audio-Tactile Correspondences in Preschoolers. *Multisensory Research, 29*(1-3): 93-111. DOI: 10.1163/22134808-00002493.

Needham, Joseph, & Kenneth Girdwood Robinson. (1962). Sound (Acoustics). In *Science and Civilisation in China, Volume 4: Physics and Physical Technology*. 126-228. Cambridge: Cambridge University Press, 1962.

Parkinson, Carolyn, Peter Jes Kohler, Beau Sievers, & Thalia Wheatley. (2012). Associations between Auditory Pitch and Visual Elevation Do Not Depend on Language: Evidence from a Remote Population. *Perception, 41*(7): 854-861. DOI: 10.1068/p7225.

Roumeguere-Eberhadt, Jacqueline. (1963). *Pensee et societe africaines*. Cahiers de l'homme. Paris: Mouton.

Rusconi, Elena, Bonnie Kwan, Bruno L. Giordano, Carlo Umiltà, Brian Butterworth. (2006, March). Spatial Representation of Pitch Height: the SMARC Effect. *Cognition, 99*(2): 113-129. DOI: 10.1016/j.cognition.2005.01.004.

Shayan, Shakila, Ozge Ozturk, Melissa Bowerman, & Asifa Majid. (2014, July). Spatial Metaphor in Language Can Promote the Development of Cross-Modal Mappings in Children. *Dev Sci 17*(4): 636-643. DOI: 10.1111/desc.12157. Epub 2014 Mar 17. PMID: 24636133.

Shayan, Shakila, Ozge Ozturk, & Mark A. Sicoli. (2011). The Thickness of Pitch: Cross-Modal Metaphors in Farsi, Turkish and Zapotec. *The Senses & Society, 6*(1): 95-105. DOI: 10.2752/174589311X12893982233911.

Stone, Ruth M. (1981, April - June). Toward a Kpelle Conceptualization of Music Performance. *Journal of African Folklore, 94*(372): 188-206. DOI: 10.2307/540124.

Timmers, R., & Shen Li. (2016). Representation of Pitch in Horizontal Space and its Dependence on Musical and Instrumental Experience. *Psychomusicology: Music, Mind, and Brain, 26*(2): 139-148. DOI: 10.1037/pmu0000146

Tracey, Hugh. (1948). *Chopi Musicians: Their Music, Poetry, and Instruments*. London: Oxford University Press.

Voisin, Frédéric. (1994). *L'accord des xylophones des Gbaya et Manza de Centrafrique* [Dissertation: Paris: Ecole des Hautes Etudes en Sciences Sociales]. HAL-LARA Libre accès aux rapports scientifiques et techniques. https://hal-lara.archives-ouvertes.fr/hal-01612624. Epub 2017 Jul 10. HAL Id: hal-01612624, version 1.

Walker, Peter, J. Gavin Bremner, Uschi Mason, Jo Spring, Karen Mattock, Alan Slater, & Scott P. Johnson. (2010). Preverbal Infants' Sensitivity to Synaesthetic Cross-Modality Correspondences. *Psychological Science*, *21*(1): 21-25. http://www.jstor.org/stable/41062158.

Zbikowski, Lawrence M. (1998, January). Metaphor and Music Theory: Reflections from Cognitive Science [Online]. *Music Theory Online, 4*(1). http://www.mtosmt.org/issues/mto.98.4.1/mto.98.4.1.zbikowski.html.

Zemp, Hugo, & Vida Malkus. (1979). Aspects of 'Are'are Musical Theory. *Ethnomusicology*, *23*(1): 5-48. DOI: 10.2307/851336.

Žuvela, Sanja Kiš & Ana Ostroški Anić. (2019). The Embodied and the Cultural in the Conceptualization of Pitch Space in Croatian. *Jezikoslovlje, 20*(2): 199-219. DOI: 10.29162/jez.2019.7.