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## **Absolute Pitch in Naturalistic Singing: A Commentary on Olthof et al. (2015)**

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**ABSTRACT:** The parent article looks at pitch stability in an archive of folksongs recorded over several decades. Some evidence for pitch stability was found. Here, I consider some additional aspects of the archive that could be examined, offer some extensions to relevant laboratory studies, and consider some inherent strengths and limitations of the naturalistic, archival approach.

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### **INTRODUCTION**

THIS article analyzes a rich naturalistic set of recordings, which complements laboratory studies suggesting that average people retain a reasonably good sense of absolute pitch for familiar songs (Schellenberg & Trehub, 2003; Levitin, 1994; Frieler et al., 2013; Halpern, 1989). The folksongs analyzed did not have a standardized score or recording, allowing investigators to see how consistent the starting pitch and key were among independent singers from similar and different geographic sub-regions of the Netherlands. Also of note, is that the (untrained) singers were of different generations, given that the archive extends from the 1950's to 1980's (van Kranenburg, de Bruin, Grijp, & Wiering, 2014). In this Commentary, I offer some remarks about the unique aspects of this study, some limitations, and ideas for future usage of this kind of archive.

### **NATURALISTIC MATERIALS**

A notable feature of Olthof et al.'s study is that the analysis uses semi-naturalistic materials. I say *semi-naturalistic* because we are not told the circumstances of recording (studio, homes, etc.) but at the least, the recordings were taken from people singing as they would in everyday situations, not subject to special instructions nor asked to carry out other tasks at the same time. The use of a recorded archive does allow the researchers to examine materials that were not collected with the current purpose in mind, which lends objectivity to the reported analyses (as does the automatized scoring of the pitch information).

As is always the case, tradeoffs occur between the naturalness of the behavior and the uniformity of the situations in which the behavior is observed. For instance, the authors mention that some recordings were taken in the context of singers being asked to produce several songs. It might be a worthwhile endeavor to encourage popular musicologists to start recording similar archives now, under a uniform set of instructions and recording parameters. Uploading recordings to a central website, where information about the singers can also be recorded, would be a valuable resource for current and future researchers. Perhaps longitudinal data could be collected from the same singers to index inter-individual variability over time. A newly commissioned archive could also include reports from the singers themselves, such as whether they tried to deliberately match the key of prior productions or that of their model, and the extent to which they thought their rendition matched those of other singers in their cohort.

### **SEX AND AGE**

One of the analyses that Olthof et al. undertook was separating the pitch stability by sex of singer. In one set of tunes, more pitch similarity was recorded for female than male singers. The authors note that, typical for an older age group, they had more female than male recordings. The small number of male singers could be one reason for the lack of stability but another possibility they raise is that songs that males learn

in childhood are inevitably sung later in life with a lower post-pubertal singing range. Differential success in remapping the remembered pitches to sung pitches could account for variability especially in a small sample. However, as male voices typically drop about an octave, one might think that men would simply (and unconsciously) perform that transposition. It is, however, possible that the fact that men retain a larger pitch range than women (because they can use falsetto in adulthood), adds variability to production choices.

My article on this topic (Halpern, 1989) did provide some evidence that young men retain memory of the songs learned in their unchanged voices. In one experiment, I had young adult men and women not sing, but choose from a keyboard the preferred starting pitch of folksongs and other culturally familiar songs. Interestingly, even though the men sang starting pitches about an octave lower than the women (i.e., not in falsetto), their choice of keyboard pitches was the same as the women's. I did not notice any difference in pitch variability according to sex in that study but, as is also typical in university participants, my sample comprised mostly women.

It might be interesting to pursue this question by carrying out a laboratory-based production study, specifically recruiting large samples of both men and women, to see if pitch variability is differentially observed in the sexes. Songs learned in childhood could be compared to songs learned in adolescence (such as pop hits) to see if post-pubertal learning in males makes a difference to stability, although that would confine stimulus materials to standardized (recorded) versions. Another advantage of a lab study is that one could test singers of different ages, which brings me to the next interesting point about the Olthof et al. dataset.

Most of the singers in the Dutch archive were older adults (it is likely difficult to extract the exact ages), which makes this an unusual contribution to the music psychology literature. Outside of a few studies in the singing literature on the acoustics and physiology of the aging voice (Baken, 2005; Ferrand, 2002; Goy, Fernandes, Pichora-Fuller, & van Lieshout, 2013), generational preferences for music of one's youth (Bartlett & Snelus, 1981), and episodic and semantic memory for music (Bartlett, Halpern & Dowling, 1995), older adults are remarkably underrepresented in the music research literature. Given that older adults have likely sung cultural songs for many more years than younger adults, it would be interesting to see if they had even greater pitch stability than younger adults. We could also examine sex differences in the differing ages: might older compared to younger men, in particular, show more pitch stability because they have had much more practice in remapping pitches of tunes learned in childhood?

### DIFFERENCES AMONG TUNE FAMILIES IN PITCH STABILITY

Only some of the tune families showed pitch stability in Olthof et al.'s study. The influence of some aspects of tune structure were examined in the current analysis; however, those aspects did not seem to explain why the more stable tunes were more stable. An analysis looking at contour might be informative: Do songs with fewer contour changes for instance, engender more stable pitch memory? The particular lyrics and geographical region may have played a role. In this respect, an archive collected from different countries, with different linguistic constraints, may shed some light on the interaction of phonology and pitch stability. Although on the less-naturalistic side, it might also be interesting to ask people to sing on a single syllable to see if actual phonological production (vs. the memory of producing the lyrics on most prior occasions) makes a difference to pitch stability.

### CONCLUSION

Olthof et al. have provided a good model for detailed analysis of archival materials using modern acoustic, statistical, and modeling techniques. Although direct evidence of oral transmission cannot be provided by this dataset, certainly several of the findings (but not all) are consistent with this interpretation. Even if that question cannot be definitively answered, the article raises a number of interesting issues with respect to pitch memory in populations not heretofore well represented in the literature.

### NOTES

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