

Does the menstrual cycle modulate how trustworthy a woman sounds?

Wilhelm K. Klatt & Janek S. Lobmaier

University of Bern, Department of Psychology

Annual conference of the European Human Behaviour and Evolution Association, Paris, France, April 6-8, 2017

Research Questions

- Does the menstrual cycle phase affect perceived attractiveness and trustworthiness of women's voices?
- Does sentence content have an influence on the speakers, the perceivers, or both?

Introduction

- Many studies suggest that women's voices are affected by menstrual cycle^{1,2,3}
- However, these studies focused on vocal attractiveness

Method

- The voice of 20 female speakers ($M = 22.7$ years, $SD = 2.3$; non-smokers, regular menstrual cycle, no hormonal contraception, no pregnancy, no breastfeeding) was recorded before ovulation and in the luteal phase
- Three sentences were of neutral content and three sentences suggested a context in which you want get to know someone
- Ovulation was determined by means of ovulation tests and the cycle phases were confirmed by means of hormone assays⁴



- For each speaker, voice recordings of both cycle phases were paired
- 60 independent perceivers (30 women, $M = 27.3$ years, $SD = 11.6$) were asked to pick the voice sample of each pair that sounded more trustworthy (Block 1) or more attractive (Block 2) in a two-alternative forced choice paradigm
- Another 60 independent perceivers (30 women, $M = 22.9$ years, $SD = 7.1$) were given the same task but with low-pass filtered recordings (400 Hz)
- All participants reported to have no hearing problems
- Low-pass filtering preserves variation in fundamental frequency but makes speech incomprehensible⁵
- In addition to the perceptual ratings, voice recordings were analysed acoustically using Praat software⁶

References

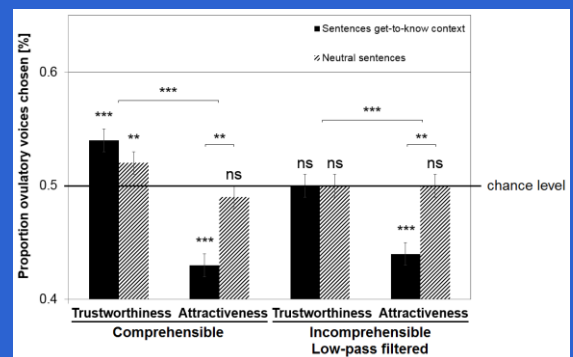
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Conclusions

- Speakers and perceivers seem to be affected by speech content
- Our findings conflict with earlier studies which found that women's voices sound more attractive when recorded during the late follicular phase than during the luteal phase

Results

- Comprehensible voice samples:
 - A 2 (task) \times 2 (sentence content) ANOVA revealed a significant effect of "task" ($F(1,58) = 35.244, p < .001, \eta_p^2 = .38$) and a significant "task \times sentence content" interaction ($F(1,58) = 11.636, p = .001, \eta_p^2 = .17$)
 - Women's voices were perceived as being **more trustworthy** around ovulation irrespective of sentence content (get-to-know context $M = .54, SD = .07, t(59) = 5.183, p < .001, r = .09$; neutral sentences $M = .52, SD = .07, t(59) = 2.679, p = .01, r = .04$) than during the luteal phase
 - Women's voices were perceived as being **more attractive** in the luteal phase, but only in sentences with get-to-know context ($M = .57, SD = .11, t(59) = 4.688, p < .001, r = .08$); in neutral sentences there was no preference for either cycle phase (chance level)
- Incomprehensible, low-pass filtered voice samples:
 - A 2 (task) \times 2 (sentence content) ANOVA revealed a significant effect of "task" ($F(1,58) = 5.199, p = .026, \eta_p^2 = .08$), a significant effect of "sentence content" ($F(1,58) = 6.943, p = .011, \eta_p^2 = .11$) and a significant "task \times sentence content" interaction ($F(1,58) = 7.236, p = .009, \eta_p^2 = .11$)
 - Women's voices were perceived as being **equally trustworthy** in both cycle phases irrespective of sentence content (get-to-know context $M = .50, p > .95$; neutral sentences $M = .50, p > .98$)
 - Women's voices were perceived as being **more attractive** in the luteal phase, but only in sentences with get-to-know context ($M = .56, SD = .11, t(59) = 4.058, p < .001, r = .07$); in neutral sentences there was no preference for either cycle phase (chance level)
- Phonetic analysis showed no cycle-dependent differences



Discussion

- Women might express increased affiliation motivation⁷ during the luteal phase in their voices, but only in sentences with social content
- Low-pass filtered recordings suggest that the speakers were affected by speech content in sentences with get-to-know context
- Evaluation of cycle-dependent changes in women's voices seems to be modulated by speech content and task

Contact Information: wilhelm.klatt@psy.unibe.ch

Special thanks: Pavel Šebesta for explaining voice analysis using Praat software.