

# Comfort-Inducing Acoustic Regularities in Music: An Attachment Perspective

Edan Tamler, Prof. Mario Mikulincer  
Reichman University

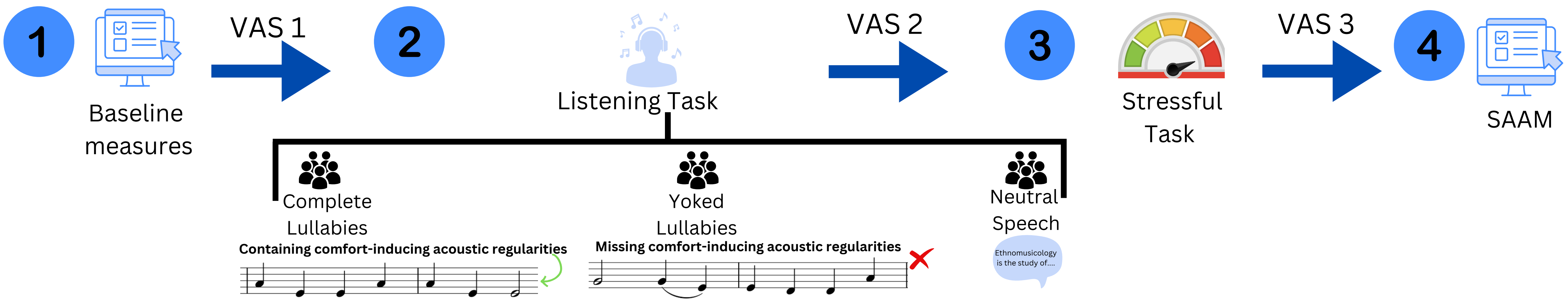


## Introduction

- Lullabies are a unique form of parent-infant song used universally<sup>[1]</sup> that innately comforts infants, allowing them to psychologically and physiologically relax.<sup>[2]</sup>
- The acoustic regularities of lullabies are characterized by the same properties of comforting speech: Low mean frequency, narrow frequency range, and legato-like soft falling contours.<sup>[3]</sup>
- These acoustic regularities may signal parental attention to infants and convey that an adult is nearby, attending to them and keeping them safe.<sup>[4,5]</sup>
- In Attachment-theory terms, infants who hear a lullaby might feel safe, protected, and comforted by what is perceived as a responsive caregiver and then experience a sense of attachment security or felt security.<sup>[6]</sup>

## Method

179 Israeli university students, 154 women and 25 men, ranging in age from 19 to 28 (Mdn = 23), volunteered to participate in exchange for academic credits. Participants were randomly divided into three experimental conditions and completed the following procedure:



## Main Results

|                | Complete Lullabies | Yoked Lullabies | Neutral Speech |
|----------------|--------------------|-----------------|----------------|
| VAS 3          | ↓                  | ↑               | ↑              |
| Engagement     | ↑                  | ↓               | ↓              |
| State Security | ↑                  | ↓               | ↓              |

- Complete lullaby listeners expressed significantly lower negative affect after performing a stressful task.
- Complete lullaby listeners expressed significantly more interest and curiosity than those who listened to yoked lullabies or a neutral speech.
- Interestingly, no difference in state-like attachment security was found between the groups, prompting us to explore whether attachment orientations played a role in moderating the calming effects of lullabies-listening.

## Conclusions

Exposure to the universal acoustic regularities that are present in lullabies elicit comfort and attachment security during a stressful task among young adults.

Just as in infancy, lullabies are particularly engaging for adults, strengthening previous theories regarding infant-directed song in signaling investment and kindness.

Attachment orientations play a role in moderating emotional reactions to lullabies-listening during adulthood with avoidance inhibiting and anxiety accentuating their comforting effects.

Music, specifically lullaby listening, can be related to as an attachment related behavior, generating similar reactions as physical or emotional intimacy.

## Can the same apparent felt security experienced in infants after hearing a lullaby be observed during adulthood?

### Hypotheses:

Listening to the acoustic regularities of comfort featured in lullabies may elicit feelings of being loved and soothed by others, thereby priming felt security and soothing distress during stressful situations in adulthood.

Specifically we predicted that adult lullaby-listeners will report:

1. Lower levels of negative affect after performing a stressful task.
2. Elevated levels of interest and curiosity (i.e. engagement) after hearing a lullaby relative to a neutral speech.
3. Elevated levels of attachment security relative to incomplete lullabies or a neutral speech.

### Experimental Question:

- Adults go through many personal and interpersonal experiences throughout their lives that may bias their response to the comfort induced by melodies contained in lullabies.
- Therefore, we also questioned- **will the comforting effects of lullabies be moderated by the listener's attachment orientation?**

## Experimental Results

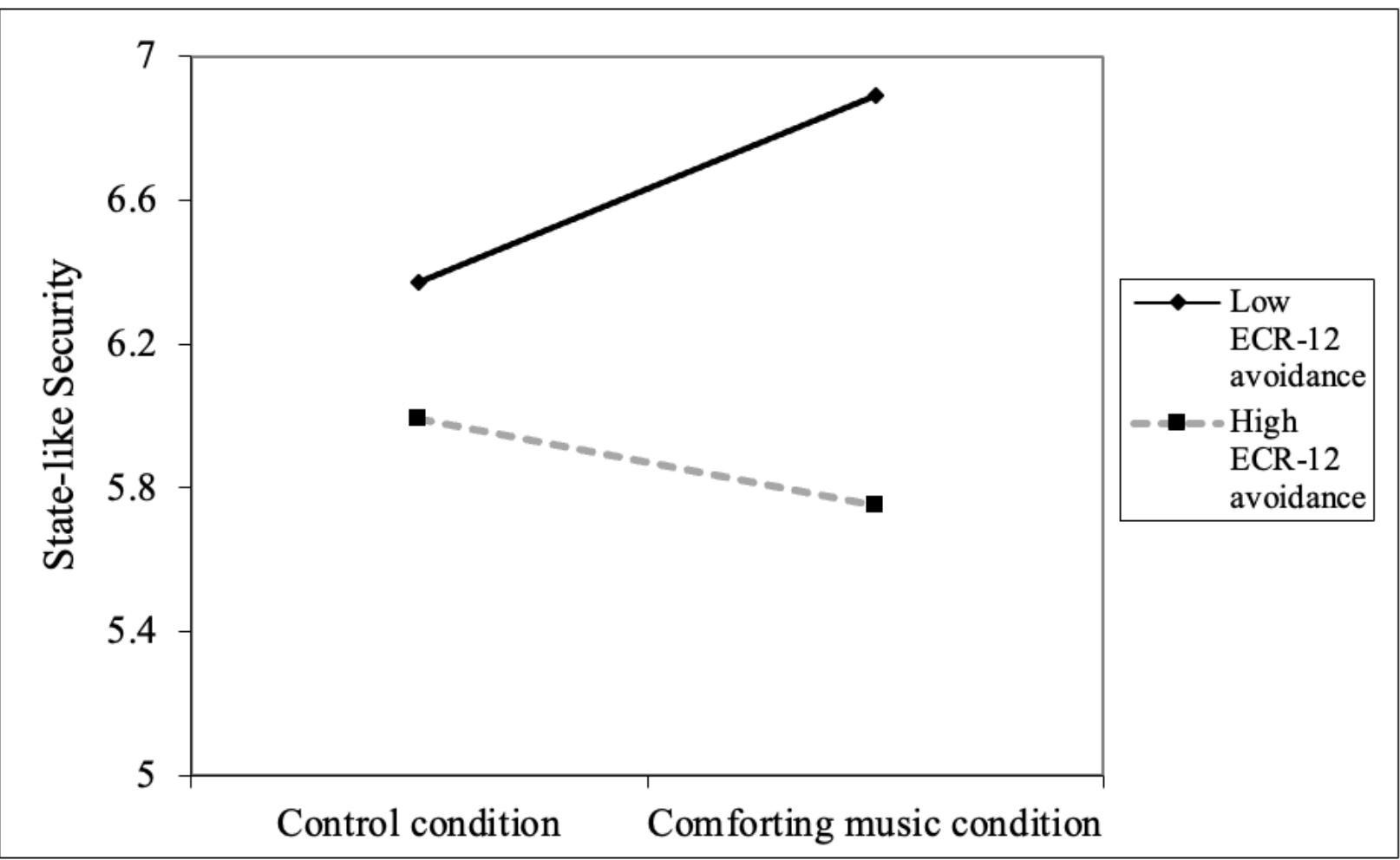


Figure 1. State-like security as a function of comforting music and ECR-12 avoidance.

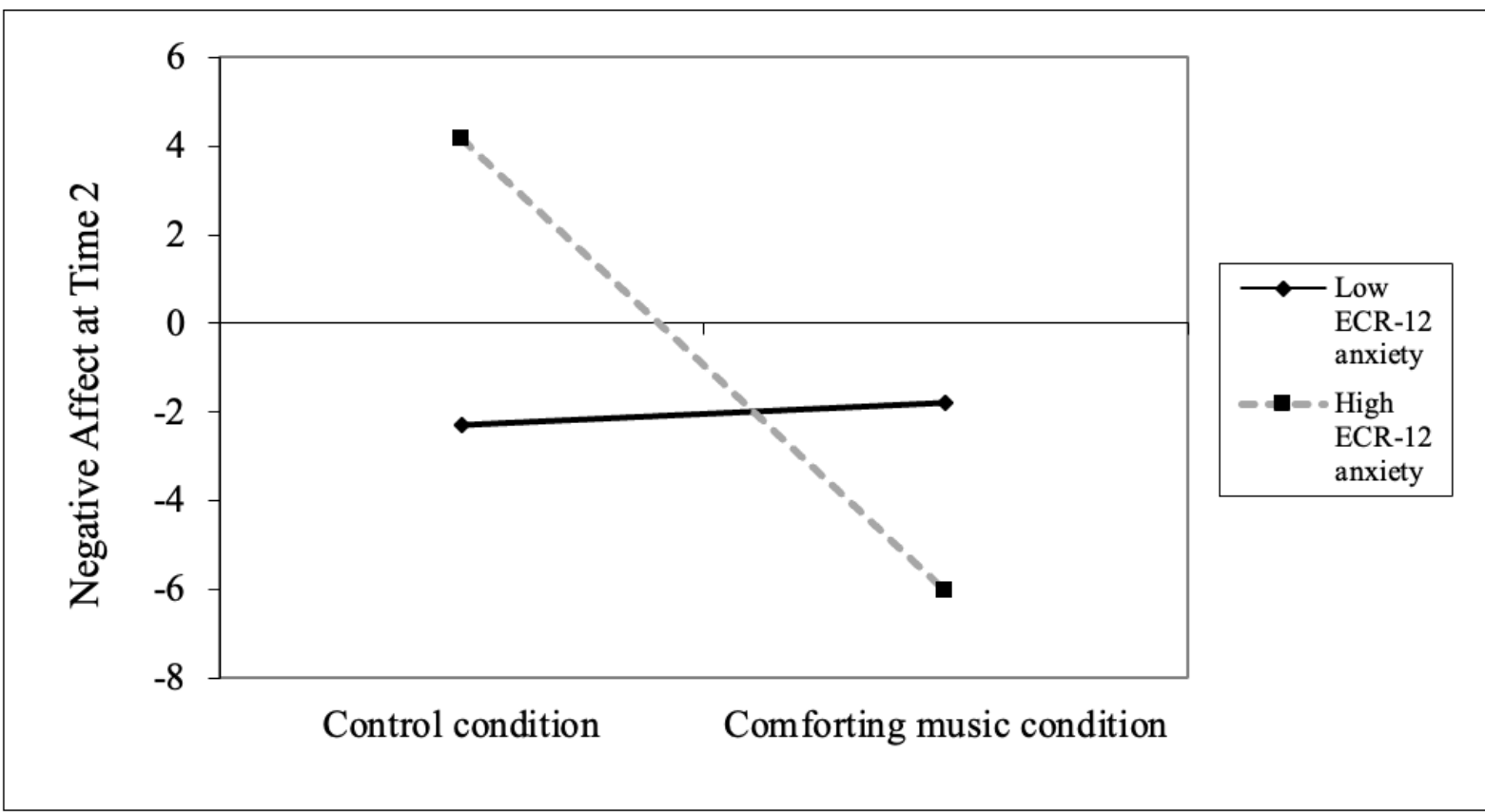


Figure 2. Negative affect at Time 2 as a function of comforting music and ECR-12 anxiety.

- Listening to a lullaby significantly heightened reports of state like attachment security only when attachment avoidance was relatively low.
- Participants with high levels of attachment anxiety benefitted more from the comfort offered by lullabies-listening than their less anxious counterparts.

## References

1. Mehr, S. A., Singh, M., Knox, D., Ketter, D., Pickens-Jones, D., Atwood, S., Lucas, C. G., Jacoby, N., Egner, A., Hopkins, E. J., Howard, R. M., Hartshorne, J. K., Jennings, M., Simson, J., Bainbridge, C. M., Pinker, S., O'Donnell, T. J., Krasnow, M. M., & Glowacki, L. (2019). Universality and diversity in human song. *Science*, 366(6468).

2. Bainbridge, C. M., Bertolo, M., Youngers, J., Atwood, S., Yurdum, L., Simson, J., ... & Mehr, S. A. (2021). Infants relax in response to unfamiliar foreign lullabies. *Nature Human Behaviour*, 5(2), 256-264.

3. Fernald, A. (1992). Meaningful Melodies in Mother's Speech to Infants. In H. Papoušek, U. Jürgens, & M. Papoušek (Eds.), *Nonverbal Vocal Communication: Comparative and Developmental Approaches* (pp. 262-282). Cambridge University Press.

4. Mehr, S. A., & Krasnow, M. M. (2017). Parent-offspring conflict and the evolution of infant-directed song. *Evolution and Human Behavior*, 38(5), 674-684.

5. Mehr, S. A., Krasnow, M. M., Bryant, G. A., & Hagen, E. H. (2020). Origins of music in credible signaling. *Behavioral and Brain Sciences*, 44.

6. Bowlby, J. (1982). *Attachment and loss: Vol. 1. Attachment* (2nd ed.). Basic Books. (Original ed. 1969)