



# Teardrop glasses

Pseudo Tears Induce Sadness in You and Those Around You

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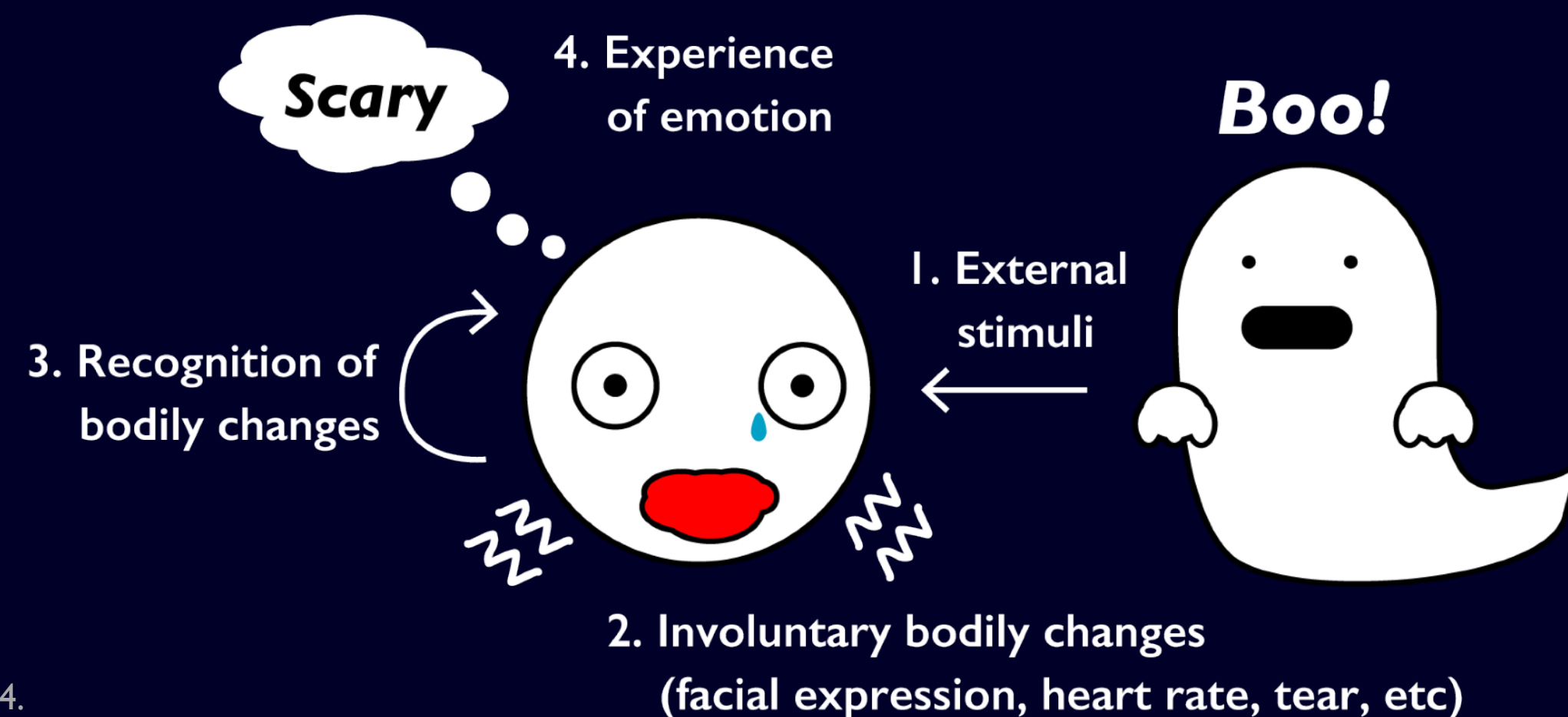
# Emotions and Bodily Changes

*“We feel sorry because we cry, angry because we strike, afraid because we tremble.”*

- William James

Recognition of our own bodily changes (e.g., facial expression, heart rate, tear) influences an emotion evoked.

- Facial Feedback Hypothesis [1]
- Suspension Bridge Experiment [2]
- False Heart-rate Feedback Study [3]



[1] S. Tomkins, Affect, imagery, and consciousness :The Positive affects, 1962.

[2] D. Dutton and A. Aron, Some evidence for heightened sexual attraction under conditions of high anxiety, 1974.

[3] S. Valins, Cognitive Effects of False Heart-Rate Feedback, 1966.

# Emotional Contagion

*“People automatically and continuously mimic and synchronize their movements.”*

- Elaine Hatfield

Emotional contagion occurs by observing another person's bodily changes or emotional expressions.

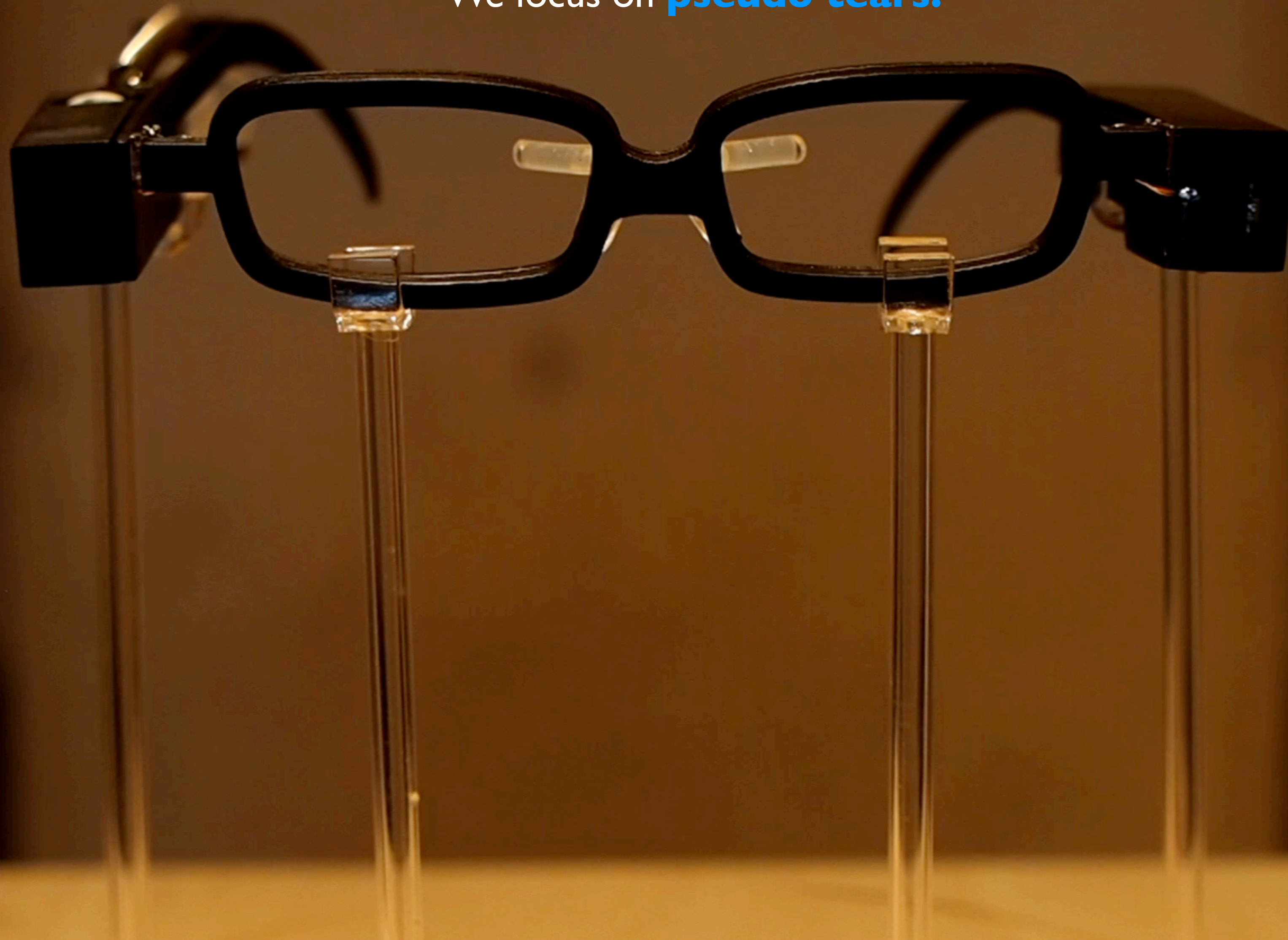
- Seeing a picture of a person crying makes people feel sad [1].
- Talking with a smile makes people feel happy [2].



[1] Jackson, et al., How do we perceive the pain of others? A window into the neural processes involved in empathy, 2005.

[2] Kimura, et al., The study of emotional contagion from the perspective of interpersonal relationships, 2008.

We focus on **pseudo tears.**

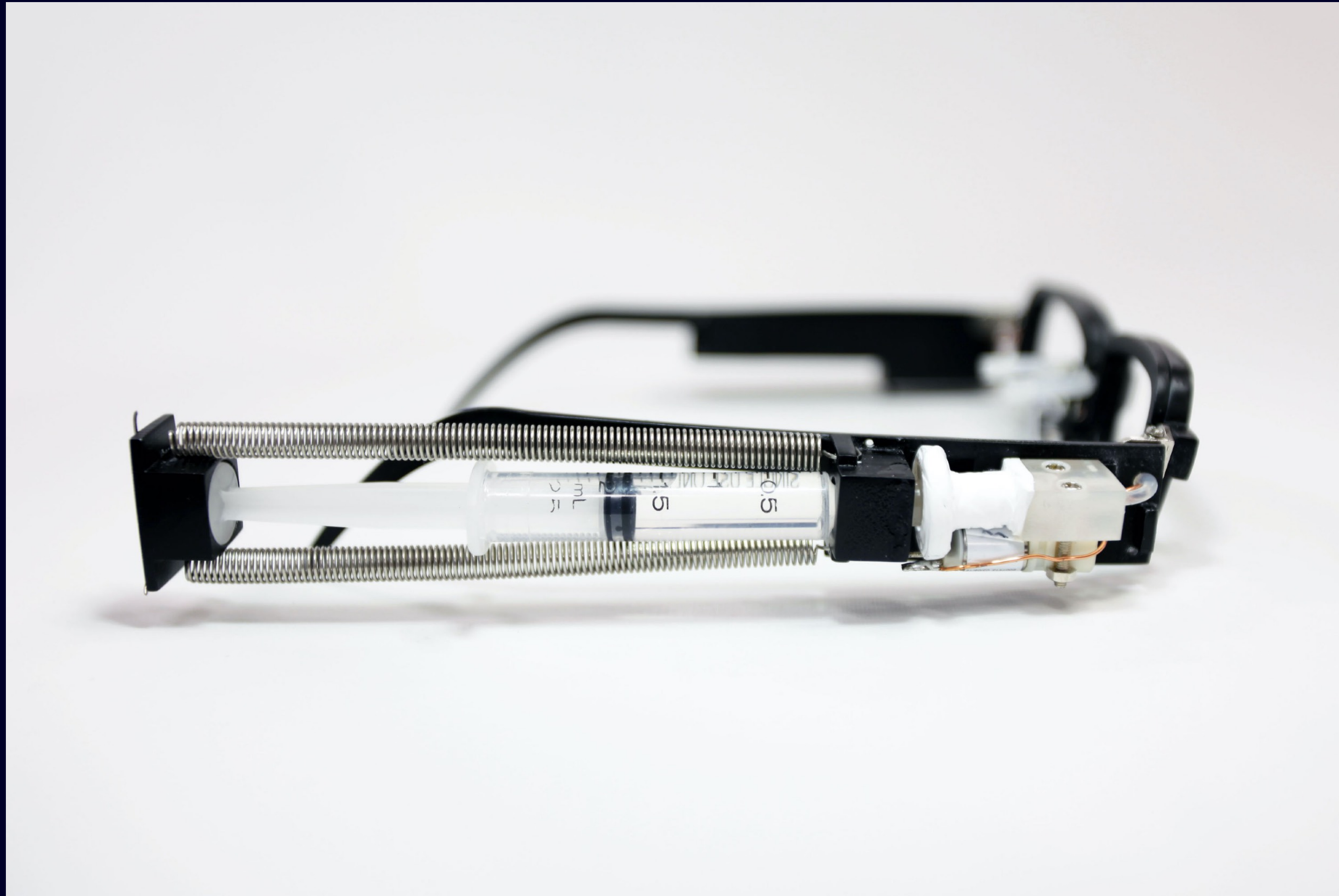




Teardrop glasses | 涙眼鏡

size: 175 × 150 × 40mm

weight: 72g (incl. water and a battery)



Motor-free mechanism.



Adjustable water release locations.

## Task: Watch 10min slideshows (9 groups)

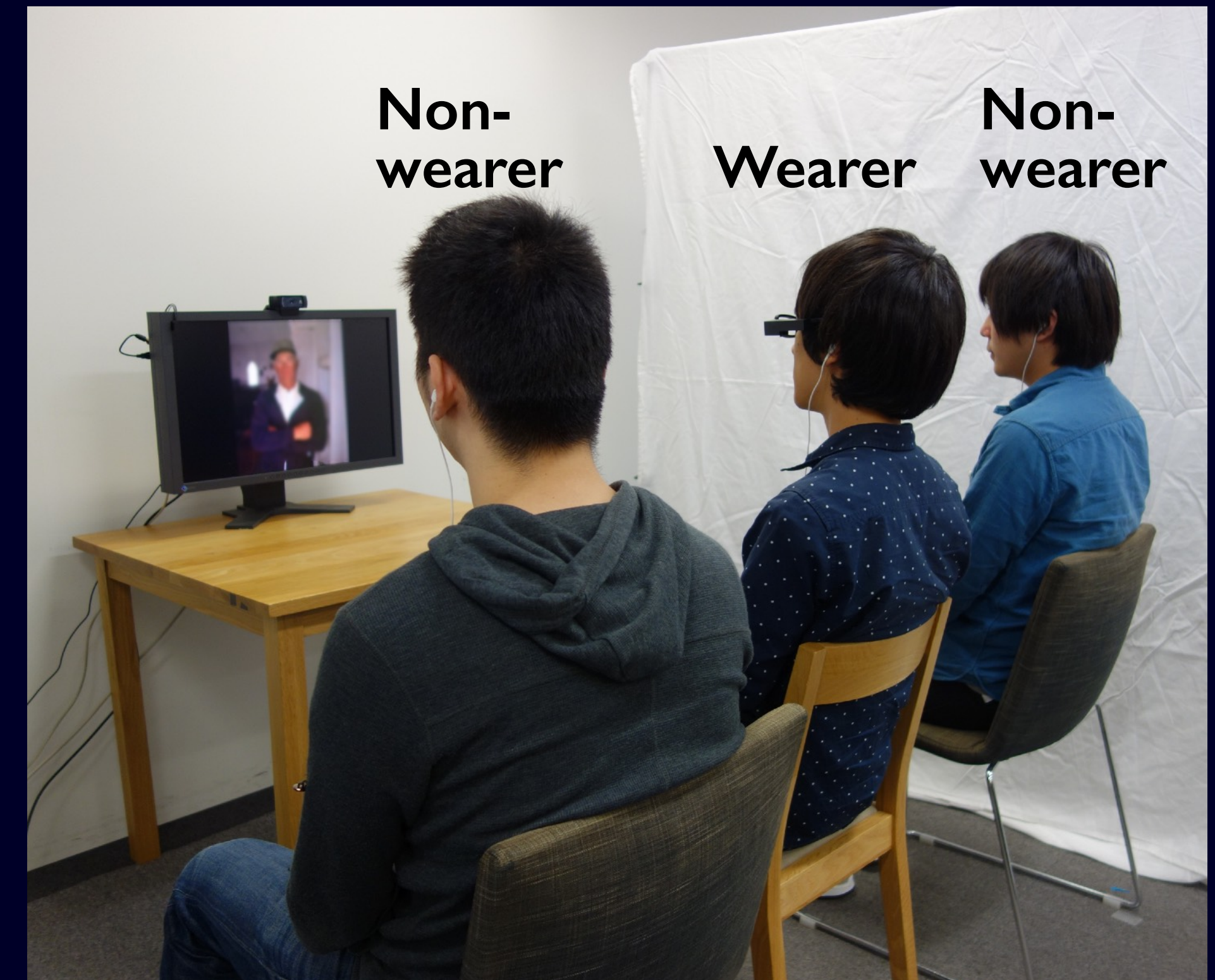
- Slideshows include 40 neutral visual stimuli [1]
- 3 different slideshows / group

## Conditions:

- *Control* (watch slideshows w/o glasses)
- *Glasses-without-tears*
- *Glasses-with-tears* (water drops every 25sec)

## Measurements:

- Sadness and happiness ratings (9-point Likert scale with dummy questions)
- Positive - negative scores (estimated by Google Cloud Natural Language API [2])

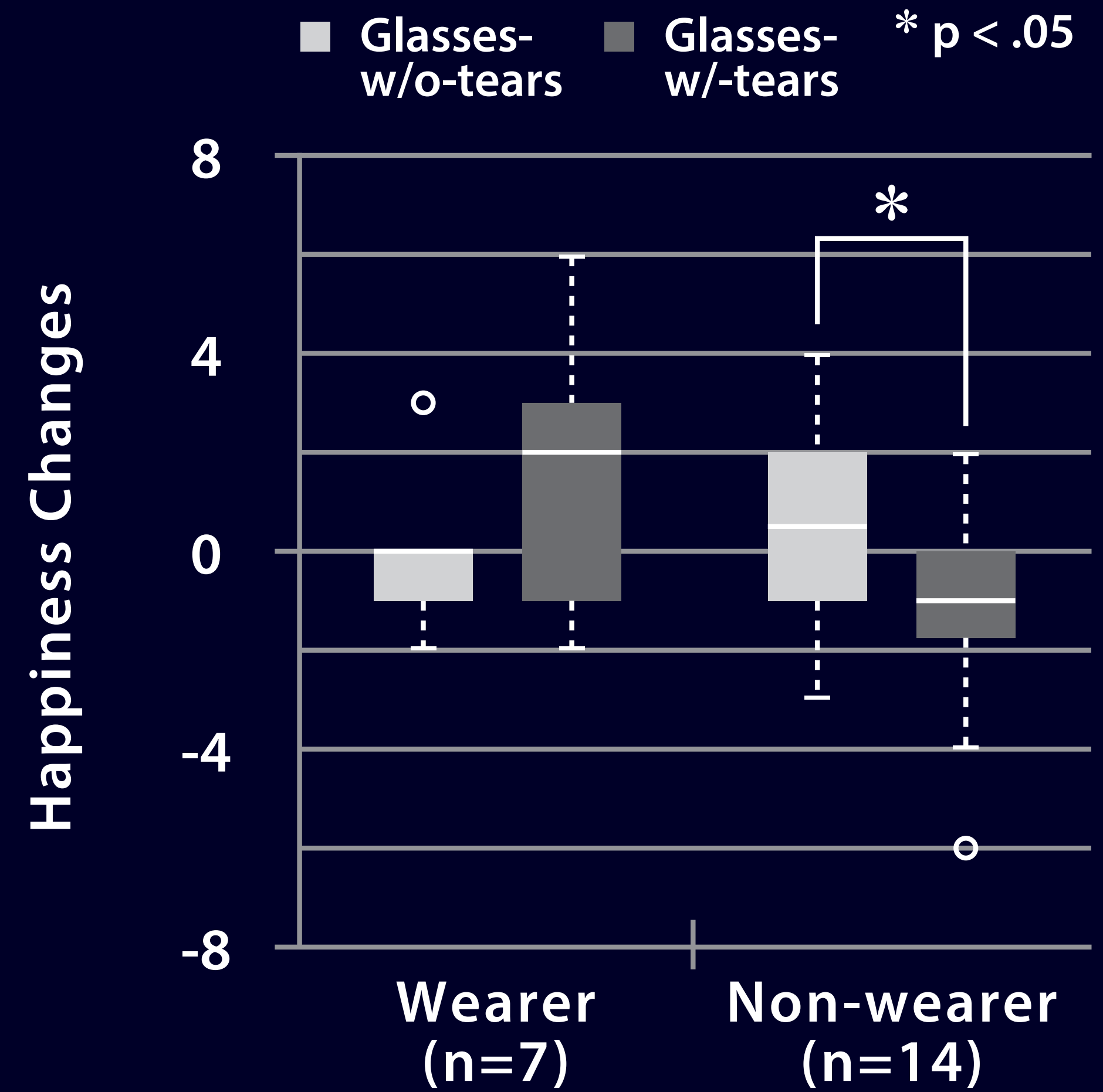
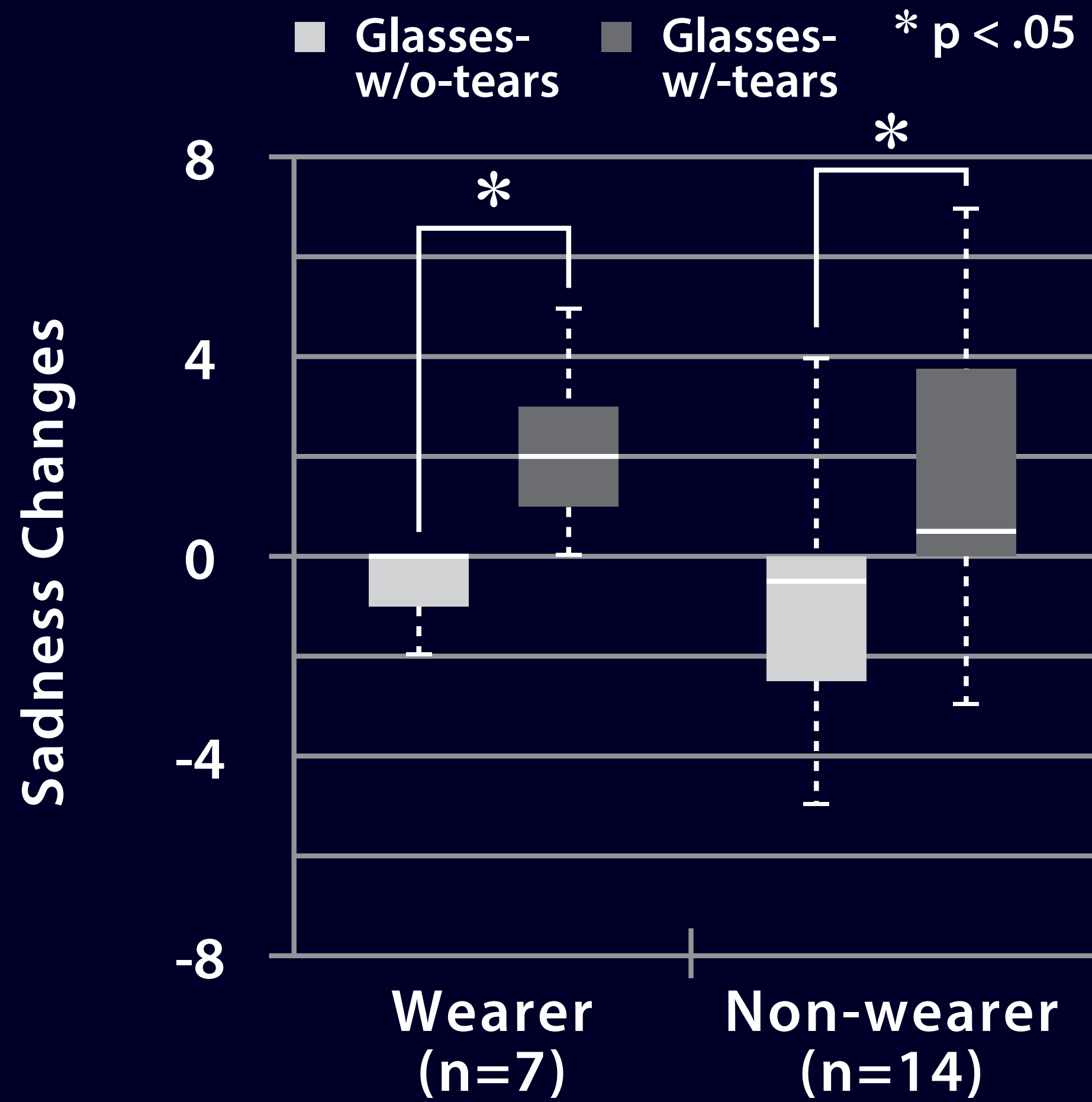


[1] Peter J Lang. 2005. International affective picture system (IAPS): Affective ratings of pictures and instruction manual. Technical report (2005).

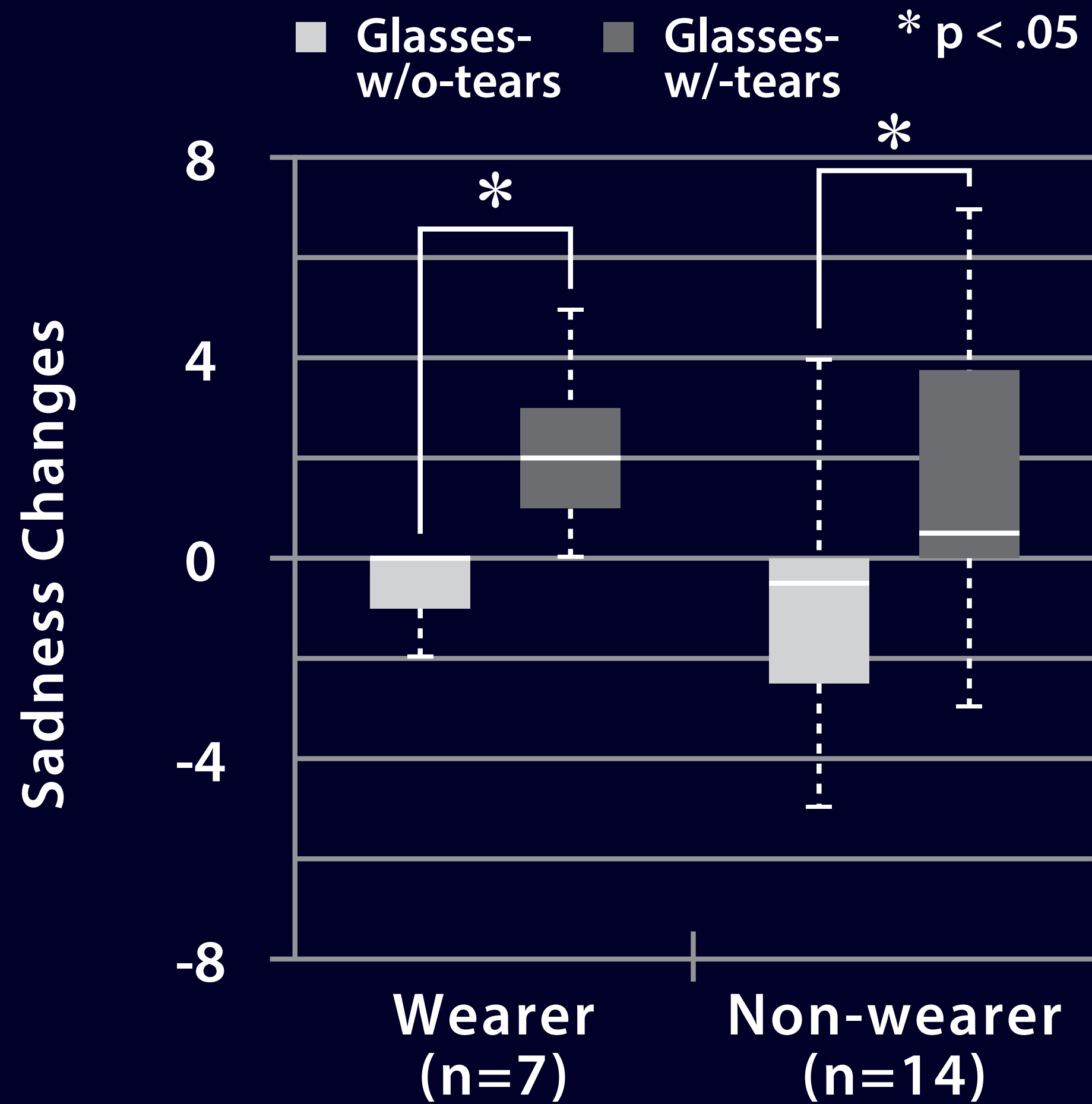
[2] <https://cloud.google.com/natural-language>



# Result: Sadness and Happiness Changes



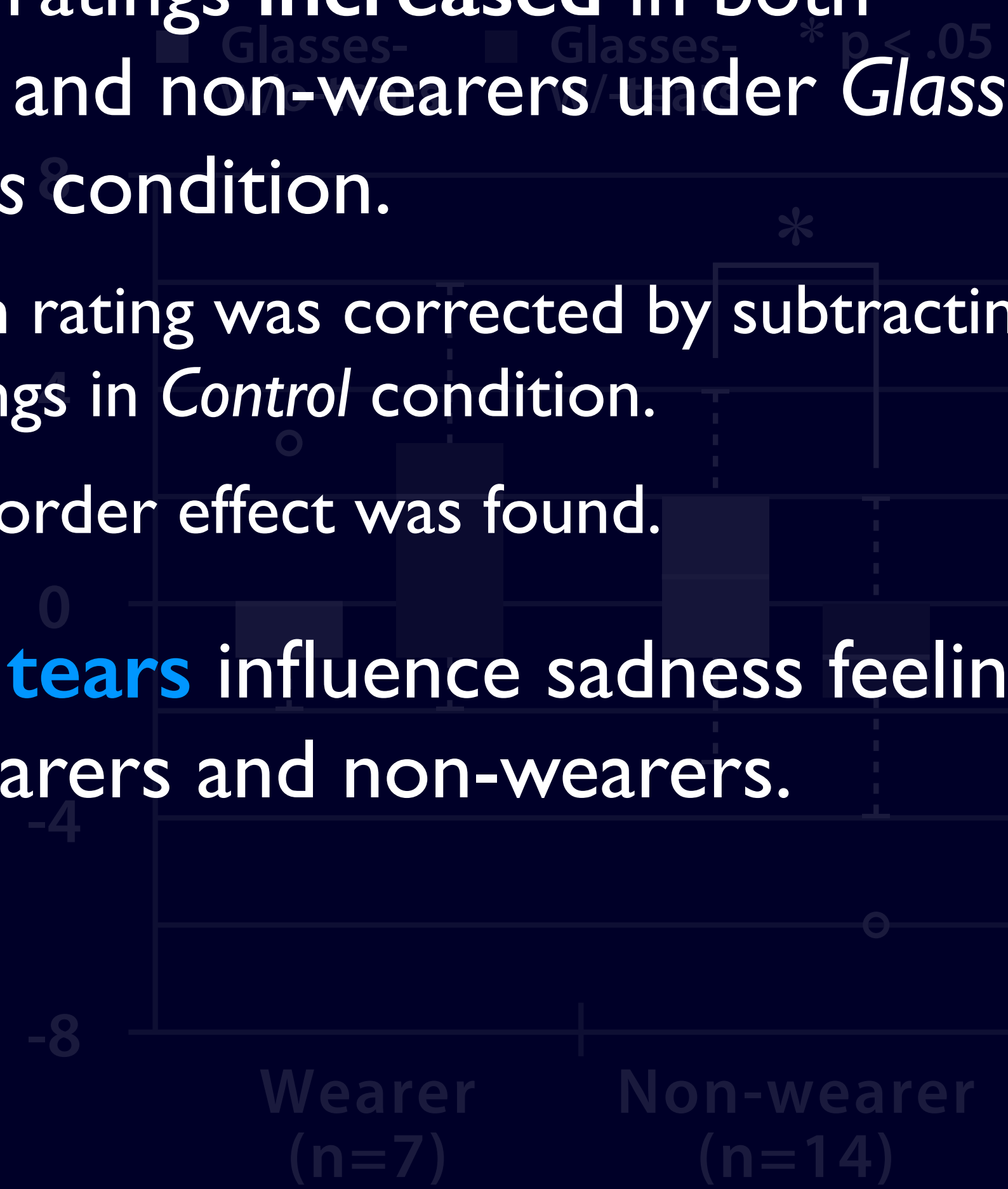
# Result: Sadness and Happiness Changes



Sadness ratings increased in both wearers and non-wearers under *Glasses-with-tears* condition.

- Each rating was corrected by subtracting the ratings in *Control* condition.
- No order effect was found.

**Pseudo tears** influence sadness feeling of both wearers and non-wearers.



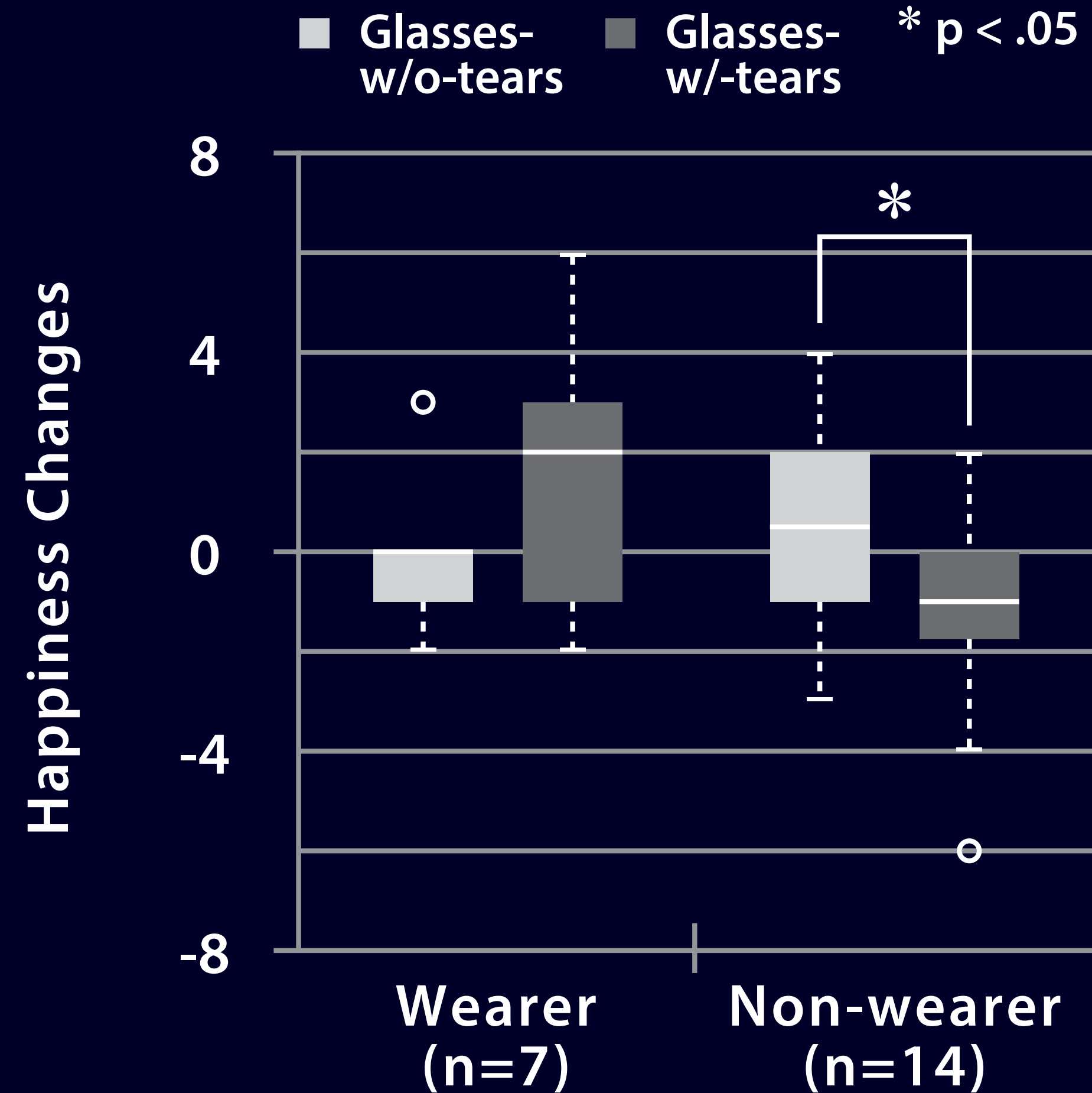
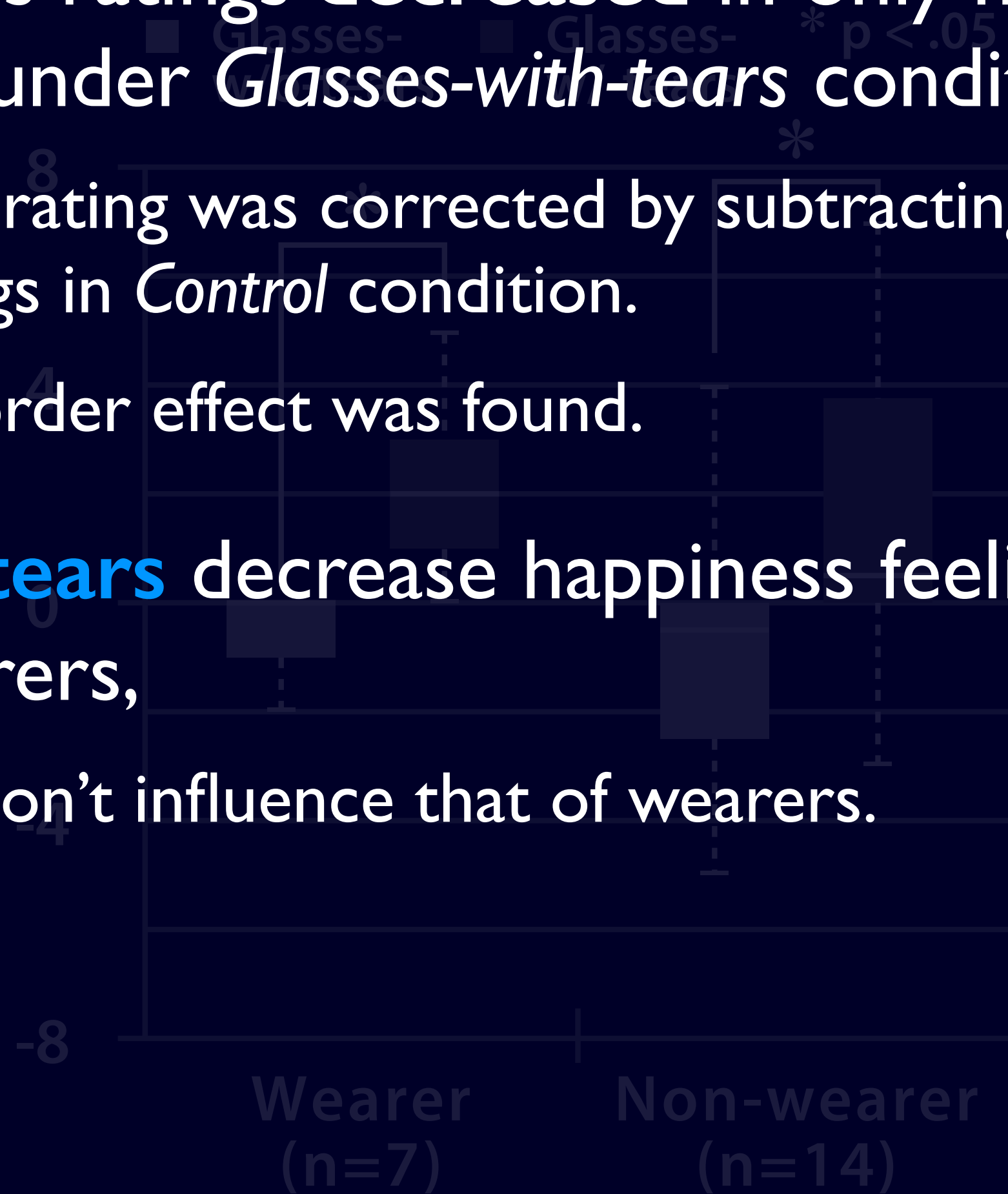
# Result: Sadness and Happiness Changes

Happiness ratings decreased in only non-wearers under *Glasses-with-tears* condition.

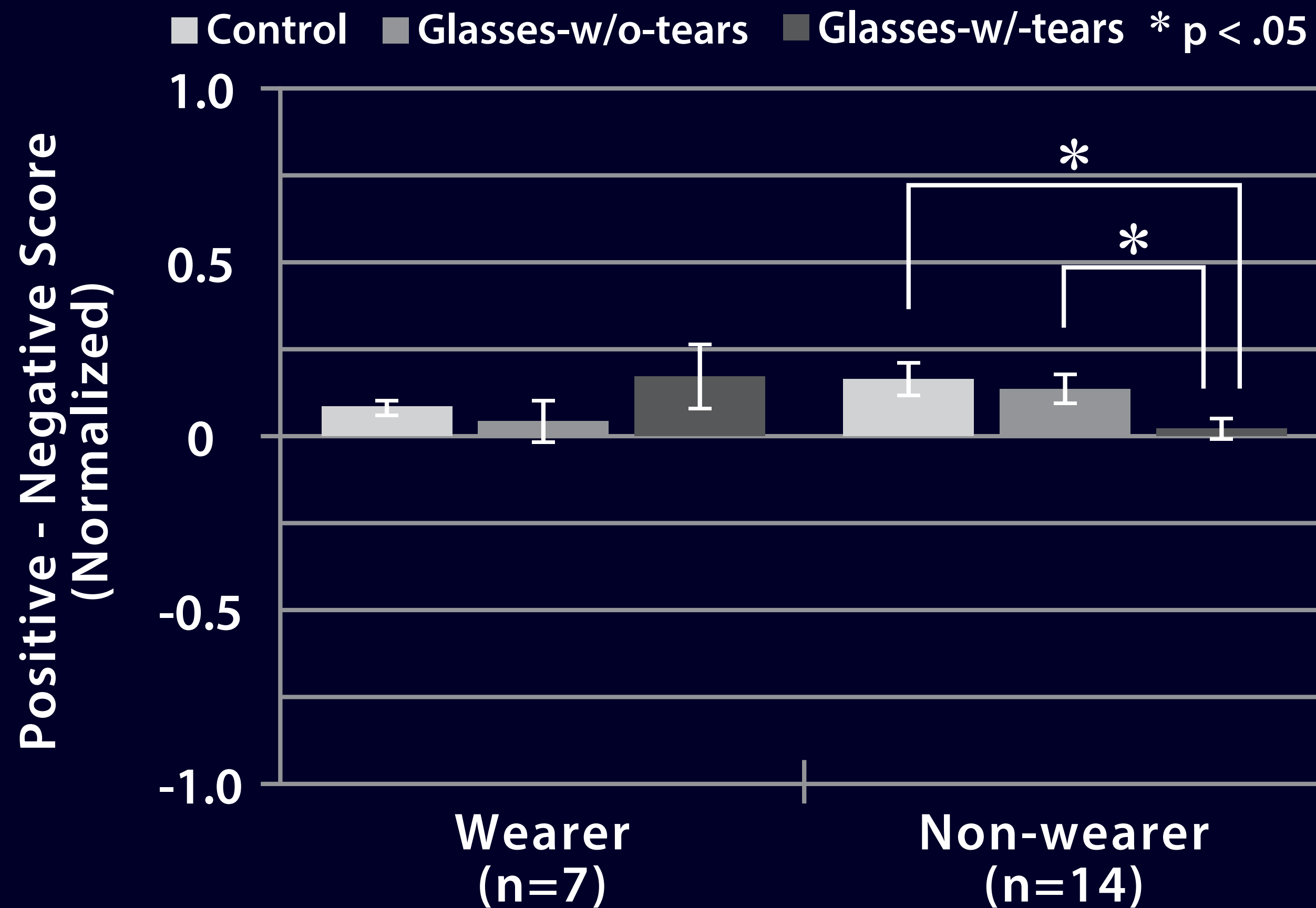
- Each rating was corrected by subtracting the ratings in *Control* condition.
- No order effect was found.

**Pseudo tears** decrease happiness feeling of non-wearers,

- but don't influence that of wearers.



## Result: Positive - Negative Score



Positive - negative score under *Glasses-with-tears* condition was lower than other conditions.

- Each score was estimated by analyzing texts that participants wrote after watching a slideshow.

**Pseudo tears** decrease positive affect of non-wearers,

- but don't influence that of wearers.

Influence on stress relief of tears?

- Some felt refreshed and settled down.

# Possible Applications



*Cry track*

Enhancing sadness or an impressive situation.

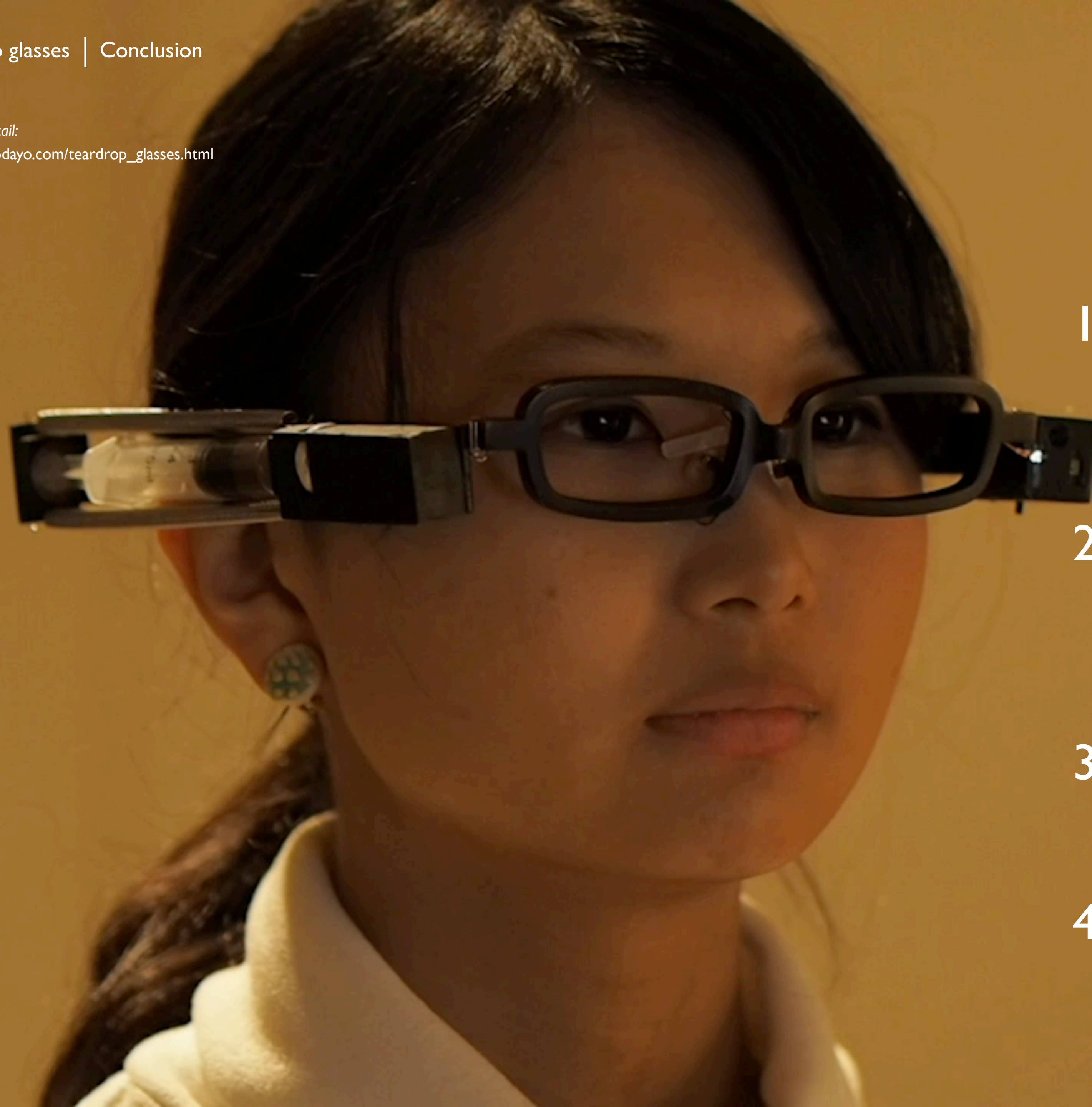


*Group therapy*

Regulating emotions of participants.

For more detail:

[www.shigeodayo.com/teardrop\\_glasses.html](http://www.shigeodayo.com/teardrop_glasses.html)



## Contributions

1. Concept of triggering emotional contagion using artificial bodily changes.
2. Design of a device that aims to trigger emotional contagion by pseudo tears.
3. Evaluations of pseudo tears on emotional contagion.
4. Non-wearers are more affected by pseudo tears.