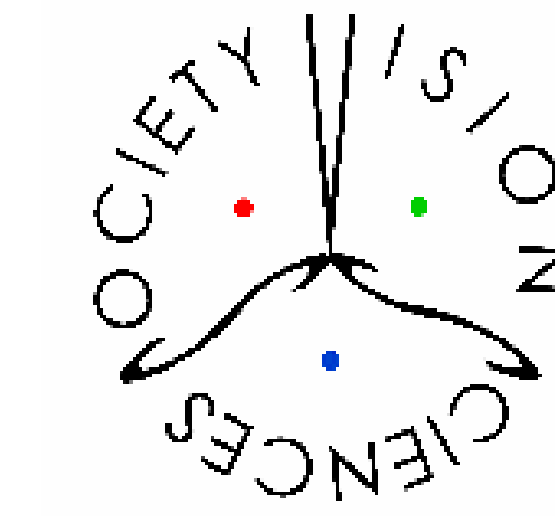




# The Effect of Mood on Perceiving Spatial Layout

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## Abstract

Previous research by Proffitt et al. (1999, 2003) showed that the perception of spatial layout (geographical slant, egocentric distance) is influenced by altering the observer's bodily state. For example, hills appear steeper and distances appear farther to participants who are fatigued, of old age, or wearing a heavy backpack. Research investigating possible links between emotion and cognition has suggested that emotional state can influence seemingly unrelated aspects of cognition (Gasper and Clore, 2002).

The current study sought to combine these two research programs by asking whether emotion (possibly an aspect of bodily state) can influence the perception of spatial layout. Mood was induced by having participants listen to happy music (major key, upbeat, Mozart's *Eine Kleine Nachtmusik*) or sad music (minor key, Mahler's *Adagietto*). While listening to the music, participants made three judgments of the slant of the hill: verbal estimate, visual matching, and a visually guided action measure (a haptic palmboard). Sad participants verbally judged the hill as being steeper than those in the happy condition, and the visual matching measure showed a non-significant trend in the same direction. As was found in previous work, the visually guided action measure was unaffected across conditions. Results support the hypothesis that the bodily state associated with a sad mood resembles that of a fatigued or encumbered participant.

## Introduction

✍ **Mood affects cognitive judgment and reasoning tasks. (Gasper & Clore, in press; Clore, 1992)**

✍ **Previous research from the Proffitt Lab has shown that the observer's physiological state can affect his perception of spatial layout.**

- Hills appear steeper to those who are wearing a heavy backpack, are fatigued, or are elderly (Bhalla & Proffitt, 1999)
- Conscious estimates of spatial layout are affected by the manipulation of physiological potential, but visually guided actions are not.
- Dissociation of the 2 visual streams of processing (Milner & Goodale, 1995)

✍ **Can a mood manipulation influence judgments of spatial layout?**

- **Do sad moods make us see hills as steeper?**

## Method

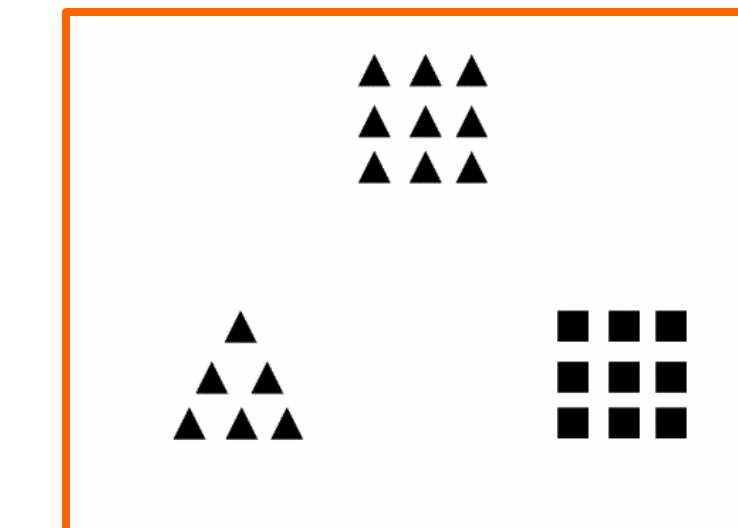
### Listen to music (10 minutes)

- 11 participants listened to "happy" music
  - Mozart's *Eine Kleine Nachtmusik*
  - for sample, listen at left
- 11 participants listened to "sad" music
  - Mahler's *Adagietto*
  - for sample, listen at right

### Perceptual Matching Task

Which of the two figures on the bottom is most similar to the figure on the top?

Left = local characteristics (made up of triangles)  
Right = global characteristics (shape of a square)



### Measures of Geographical Slant

#### Verbal Estimate

How steep is that hill (in degrees)?



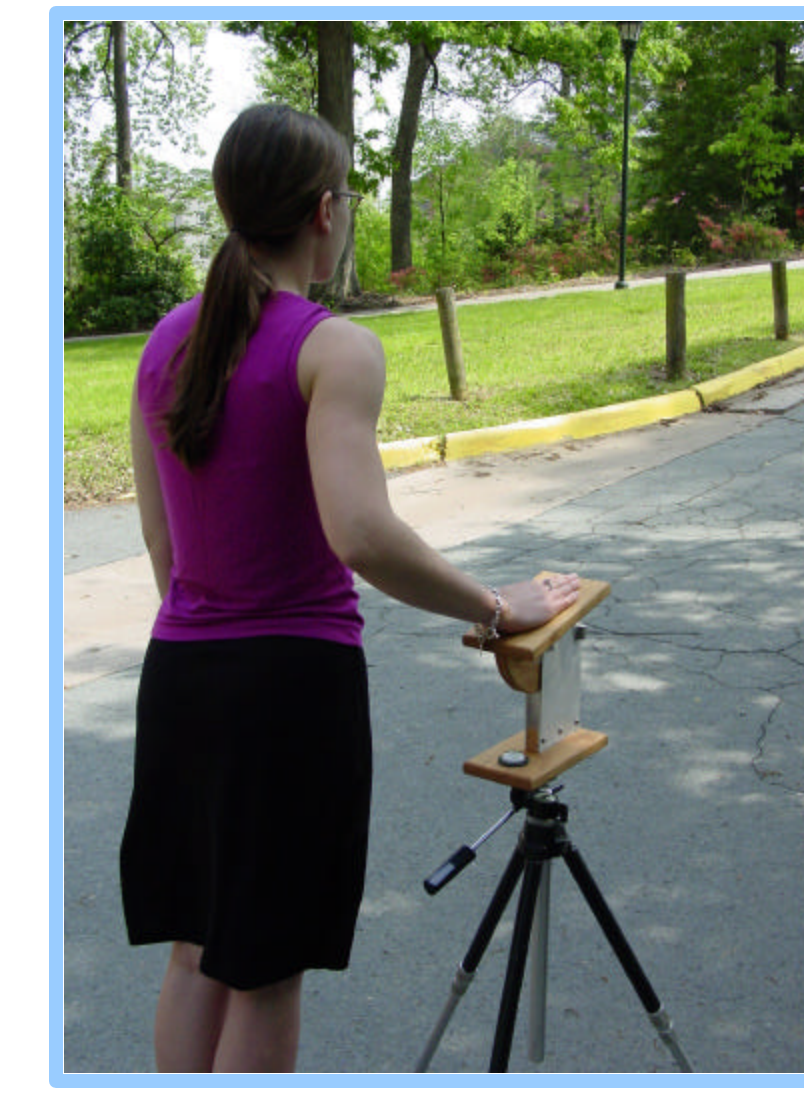
#### Visual Estimate

Set the disk to the slant of the hill



#### Haptic Estimate

Set the board to equal the slant of the hill



### Mood Measure

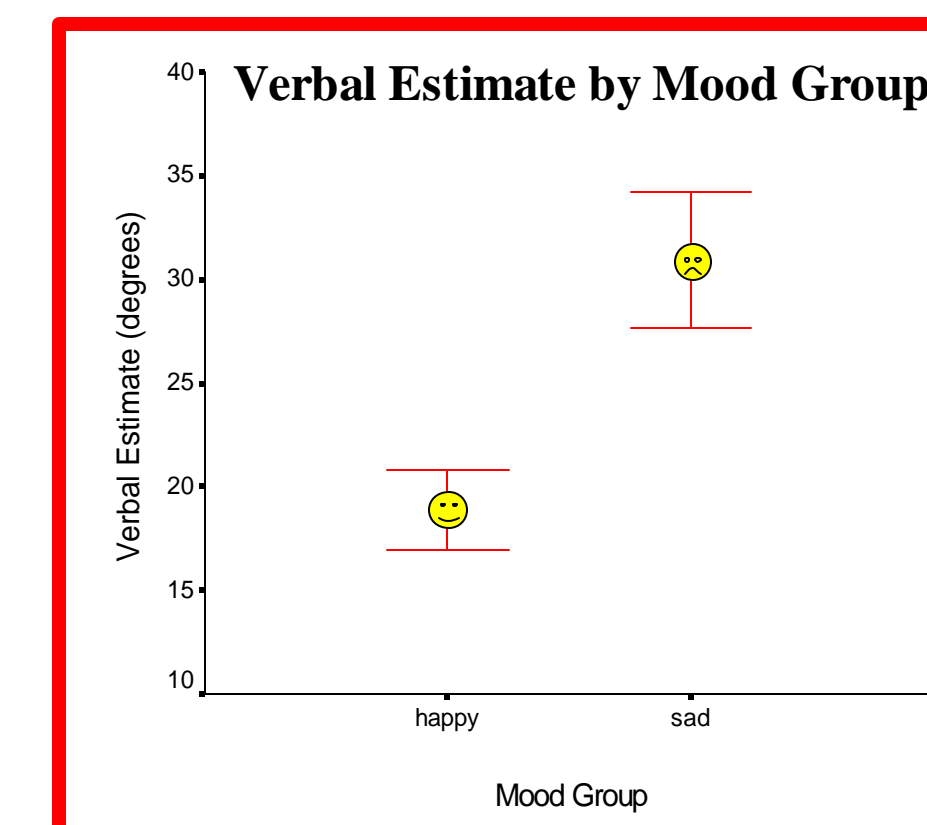
For each of the following words, rate how well it describes you at this moment

Happy, Upset, Joyful, Elated, Bored, Disturbed, Content, Confused, Satisfied, Sad, Glum, Upset

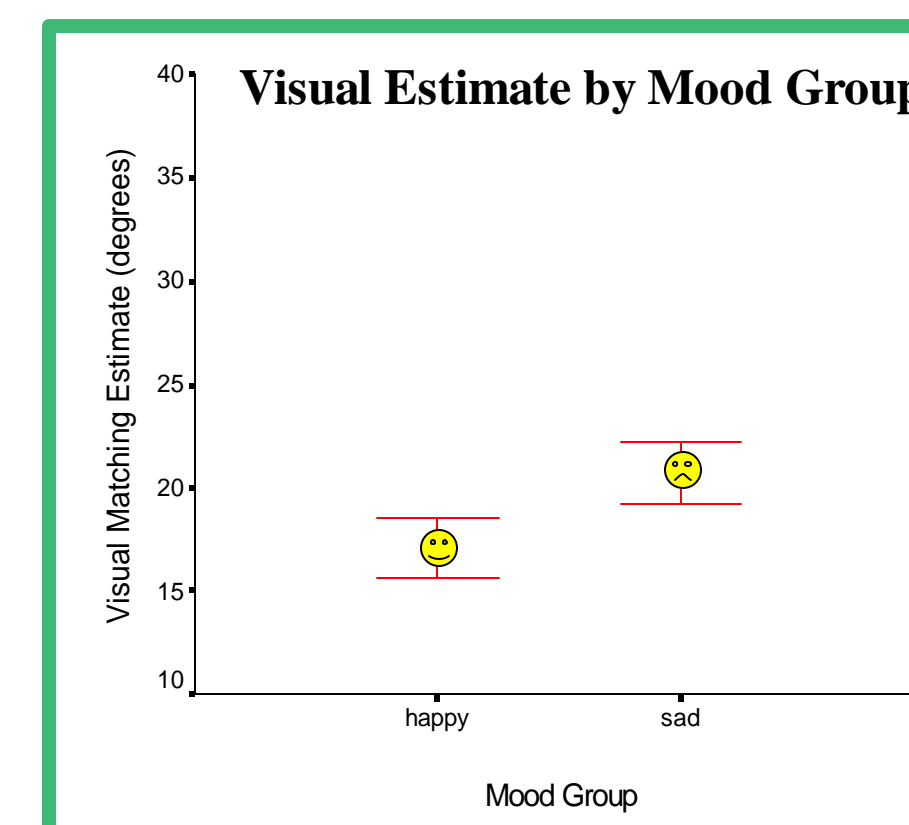
\* Adapted from Larsen & Diener (1992)

## Results

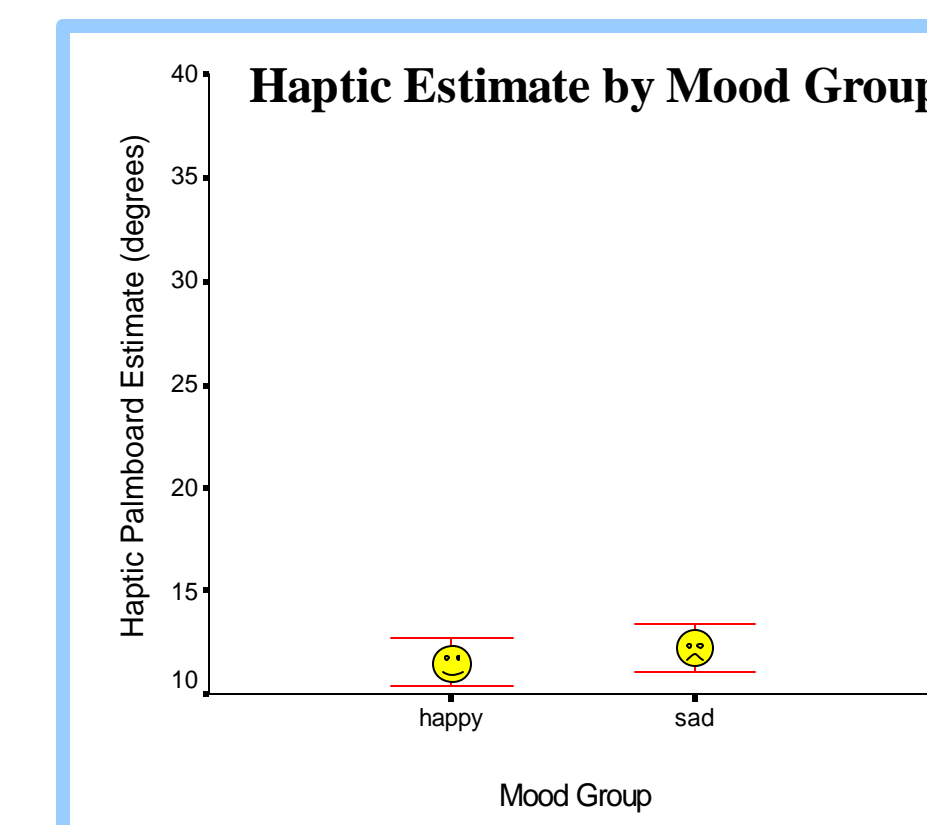
Verbal estimates were significantly different across mood group



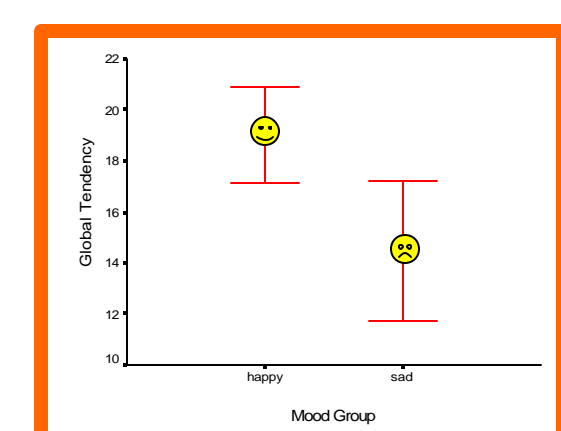
Visual estimates exhibited a non-significant difference trend across mood group



Haptic estimates were not different across mood group



The perceptual matching task exhibited a non-significant trend in the expected direction (happy mood = more global judgment strategy)



The ratings of mood words did not differ across the two groups

## Discussion

The findings of this study are consistent with previous findings in the Proffitt Lab, but also seem to complicate the construct of perceived effort and physiological state. Consistent with previous findings, the verbal and visual judgments seemed to be affected by the manipulation, while the haptic judgment remained accurate in both groups. This dissociation offers further evidence that the verbal and visual estimates are associated with a different representation than the haptic palmboard estimate. In the past, this has been explained by Milner and Goodale's two visual streams; one responsible for conscious cognitive planning, and the other the online visual control of action. Our evidence suggest no reason for departing from that explanation.

While the pattern of change is nearly identical to that of previous studies, (Bhalla and Proffitt 1999, Proffitt et al 1995) the previous studies are either clear manipulations of perceived effort, such as a heavy backpack, or demonstrations of the influence of physiological state, such as fatigue, physical fitness, or old age and declining health. The variable in this study is simply different types of music, previously known to trigger different mood states. Manipulations of mood state have been shown to influence cognition in the past (Clore, 1992; Schwarz, 1998; Gasper & Clore, in press) but influences on perception are more rare and controversial. Is this an influence of mood on perception, or mood on cognition?

This research suggests two avenues of future research. First of all, similar to other findings of mood manipulations in the *affect-as-information* hypothesis, would an attribution manipulation (reminding the participants of their mood state) nullify the effects? Secondly, is mood the only thing being manipulated? We intend on measuring heart rate as a rough estimate of arousal to determine whether arousal may be moderating the effect of mood.

## Conclusion

- Different mood states can influence conscious judgments of geographical slant.
- Participants who listened to sad music verbally judged the slope of a 5 degree hill to be (on average) over 30 degrees.
- Participants who listened to happy music verbally judged the slope of a 5 degree hill to be (on average) around 20 degrees.
- Future research will investigate whether the music is actually influencing mood alone, or if the observed effect is due to a relative change in heart rate or arousal, and an associated change in perceived geographical slant

## References

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