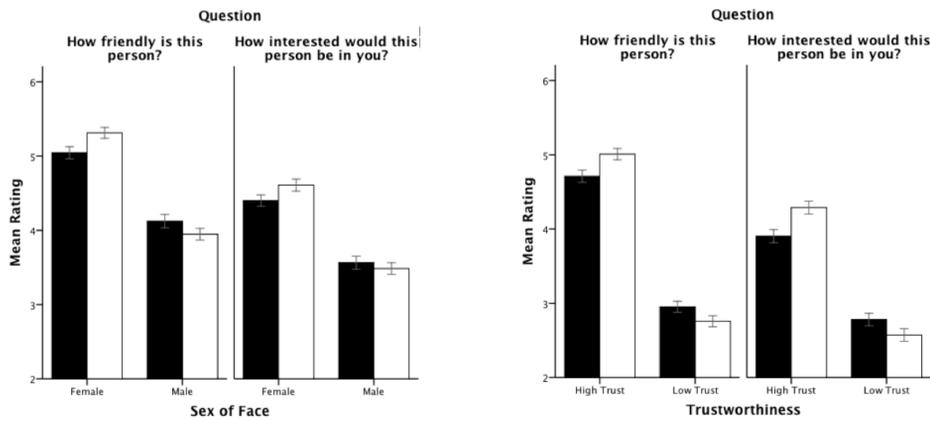


Pupil size changes influence lasting person perceptions.

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Background

Pupil size is a subtle social cue that has long been known to influence aspects of person perception, such as attractiveness (Hess, 1965). Recently, Pawling et al., (2016) demonstrated for the first time that changes in pupil size are also unconsciously encoded into long-term memory. These subtle cues have a lasting effect; influencing our judgments of others when they are retrieved during a later interaction. However, the effect of another's pupil size appears to be context specific whereby in some instances dilated pupils may be perceived as a signal of friendliness, and in others as a signal of threat.

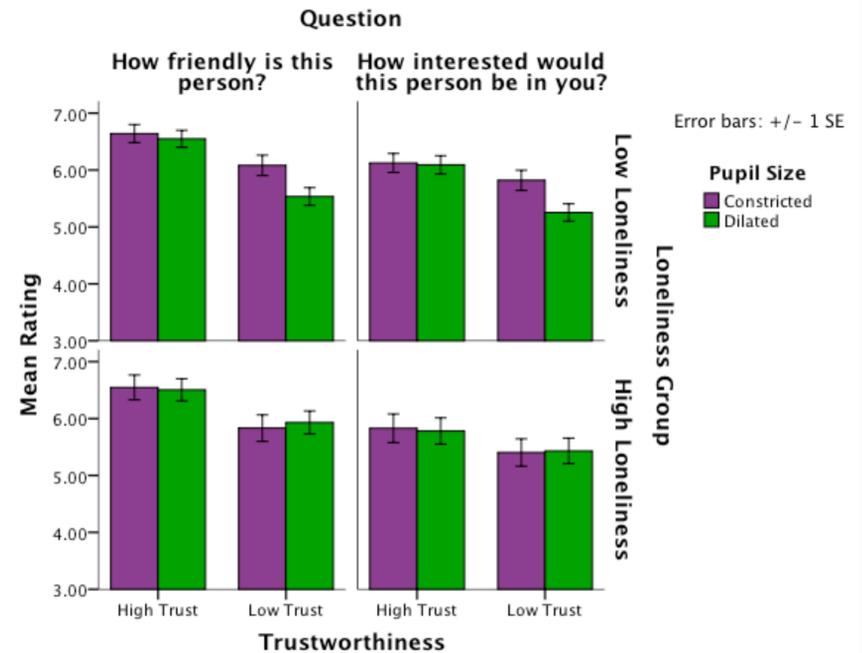


A preference for faces whose pupils previously dilated, compared to constricted is seen when the face viewed is female. However, when the face viewed is male, the opposite pattern is observed and this time faces whose pupils previously constricted are preferred.

When high and low trustworthy male faces are viewed a similar effect is seen. The preference for faces whose pupils previously dilated compared to constricted is observed, but only for high trustworthy faces. For low trustworthy faces, the opposite pattern is observed.

Here we explore how the effect of pupil size, in high and low trust faces, might be modulated by individual differences and participant gender.

Results – Individual Differences



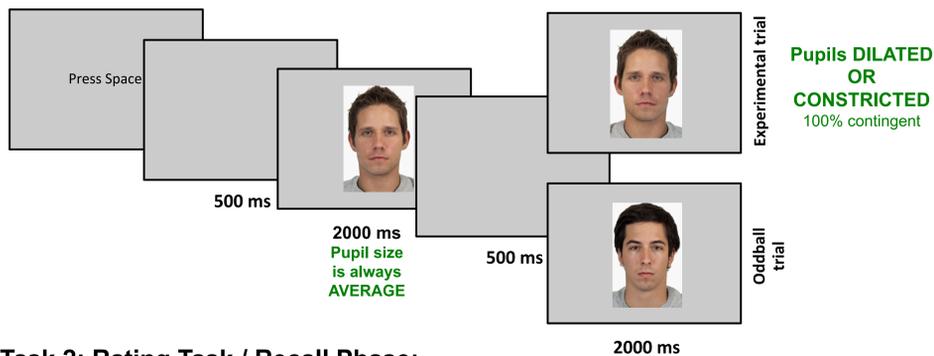
- Mixed-measures ANOVA: 2 (trust: high vs. low) x 2 (pupil: dilated vs. constricted) x (question: friendly vs. interested) x 2 (UCLA: high vs. low)
- For the low trust faces, participants rated faces whose pupils previously dilated as less friendly and less interested than faces with whose pupils previously constricted. This pattern is similar to that seen in Pawling et al. (2016) for high/low trust and female/male faces.
- This was however only true for participants who scored as low on the UCLA. For individuals who scored high on the UCLA, no pupil x trust effects were observed. Trust x pupil x UCLA: $F(1,59)=5.45, p=0.02$
- There was no effect for the STAI-T.

Method

Participants (N=64; 54 female) completed two tasks.

Task 1: Vigilance Task / Encoding Phase:

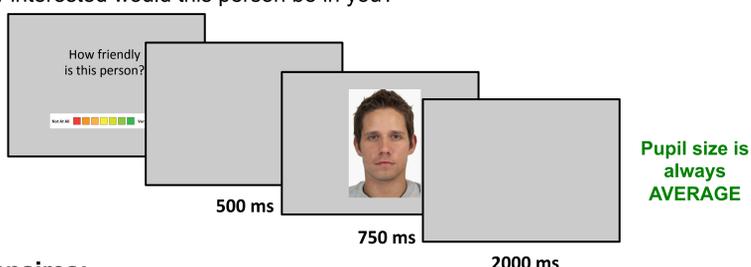
A new set of faces was used for the current study. Sixteen male faces were used (8 low trustworthy, 8 high trustworthy; attractiveness matched across trust). Each face was initially presented with had average sized pupils. After a 500 ms gap, the same face was presented with either DILATED or CONSTRICTED (experimental trials; randomised and presented with equal frequency for high and low trust faces) or a different face was presented with average pupil size (oddball trials; 40/240). Participants were instructed to detect changes in facial identity only, by pressing the space bar. Participants were UNAWARE of the pupil changes.



Task 2: Rating Task / Recall Phase:

Faces appeared with AVERAGE sized pupils. Participants responded to two questions (randomised) in relation to the faces from the previous task using a 7-point scale (not at all – very much):

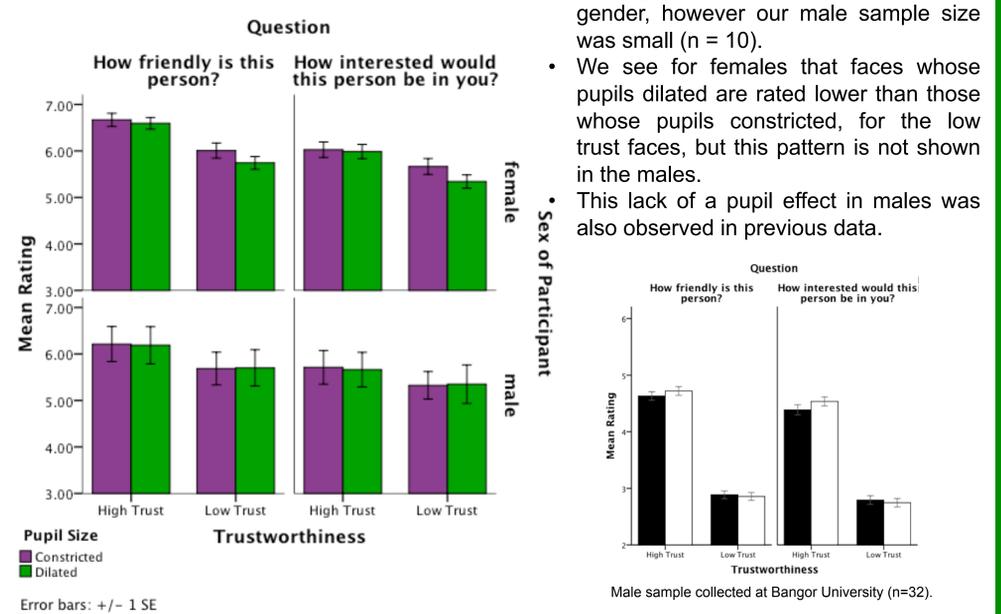
- "How friendly is this person?"
- "How interested would this person be in you?"



Questionnaires:

- Spielberger Trait Anxiety Scale (STAI-T; Spielberger et al., 1970)
- UCLA Loneliness Scale (UCLA Version 3; Russell, 1996)

Results – Gender



- No significant effects were seen for gender, however our male sample size was small (n = 10).
- We see for females that faces whose pupils dilated are rated lower than those whose pupils constricted, for the low trust faces, but this pattern is not shown in the males.
- This lack of a pupil effect in males was also observed in previous data.

Discussion

In this study we have replicated the same pattern of effects observed by Pawling et al., (2016). Pupil size changes are encoded into memory alongside other contextual factors. In certain situations (low trust faces), dilated pupils may be perceived as a signal of threat and we rate such individuals as less friendly and less interested than when they have constricted pupils.

This ability, to encode these implicit and subtle social cues into memory and later retrieve these to guiding our judgments, appears to be disrupted in individuals who report high levels of loneliness.

The effective encoding of social cues is an important psycho-social skill enabling us to appropriately interact with others and successfully navigate our social world. Loneliness, defined as a subjective experience of lack of connectedness (Heinrich & Gullone, 2006), might be caused by deficits in social skills (Segrin & Flora 2000). The results of this study tell us something about the social-cognitive mechanisms that might mediate feelings of loneliness.

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