Measuring age-specific sexual preferences with pupil dilation

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Outline

Introduction
- Why do we need a measure of sexual interest?
  - Pupil dilation: A neglected measure

Our Research
- Experiment 1
- Experiment 2

Conclusion
- Summary
- Future Research
Why do we need a measure of sexual age preferences?

(Gannon, Ward, & Polaschek, 2004; Hanson et al., 1998; Hanson & Morton-Bourgon, 2005)
Why do we need a measure of sexual age preferences?

‘Deviant’ sexual preferences primary predictor in recidivism of child sex offenders

Risk assessment during and following a treatment programme by Clinical and Forensic Psychologists

Determine appropriate treatment programme for child sex offenders

(Gannon, Ward, & Polaschek, 2004; Hanson et al., 1998; Hanson & Morton-Bourgon, 2005)
Limitations of current measures

High false negative rates amongst child sex offenders:

(O’Donohue & Letourneau, 1992; Golde et al., 2000)
Limitations of current measures

High false negative rates amongst child sex offenders:

**Social desirable responding** in self-report assessments

**Inhibition or suppression** of genital arousal responses in Phallometric measures

**Random responding** in Attentional and Reaction Time Tasks

(O’Donohue & Letourneau, 1992; Golde et al., 2000)
Pupil dilation and sexual arousal

Autonomic Nervous System

Involuntary, instantaneous dilation

Difficult to suppress

(Laeng et al., 2013; Lowenfeld et al., 1993; Zuckerman, 1971)
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Sexual arousal

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Normative Sexual Preferences

- Hess et al.
- Scott et al.
- Hamel et al.
- Garrett et al.
- Aboyoun et al.

Deviant Sexual Preferences
Normative Sexual Preferences

1960

Hess et al.

1970

Scott et al.

Hamel et al.

1980

Garrett et al.

1990

Aboyoun et al.

2000

2010

Rieger et al.

Deviant Sexual Preferences

Atwood & Howell
If pupil dilation can indicate sex-preferences...

can it also reflect sexual age preferences in a non-deviant population?
Experiment 1

- Non-deviant males and females

- Heterosexual participants

- Natural scenes of adults and children
Experiment 1: Procedure

- 20 male & 20 females
- Heterosexual
- University of Kent Students

'View images naturally'

- 1-s
- 5-s
- 1-s

Sexual Orientation Information & Interest in Child Molestation Proclivity scale (Gannon & Connor 2011)
Experiment 1: Stimuli
Experiment 1: Procedure

20 male & 20 females
Hetero-
University of Kent Students

Pupil Size  Eye Movements

‘View images naturally’

1-s  5-s  1-s

Sexual Orientation Information &
Interest in Child Molestation Proclivity scale (Gannon & O’Connor 2011)
Experiment 1: Results

Mean Pupillary Change (%)

-10  -8  -6  -4  -2  0  2  4  6  8  10

Male Observers  Female Observers

*p ≤ 0.01  *p ≤ 0.01**  p ≤ 0.001***
Experiment 1: Results

![Graph showing mean pupillary change by gender and observer type with significant differences indicated by asterisks: *** for p ≤ 0.001, ** for p ≤ 0.01, * for p ≤ 0.05.]

\[ p \leq 0.01 \ast, p \leq 0.01\ast\ast, p \leq 0.001\ast\ast\ast \]
Experiment 1: Results

[p ≤ 0.01 *, p ≤ 0.01**, p ≤ 0.001***]
Experiment 1: Discussion

Heterosexual males consistently showed dilation to adult women.
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95% of men's pupils dilated more to women than girls

Heterosexual males consistently showed dilation to *adult women*
Experiment 1: Discussion

Heterosexual males consistently showed dilation to adult women.

95% of men's pupils dilated more to women than girls.

Heterosexual females showed dilation to both adult men and women.
Experiment 1: Discussion

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Heterosexual males consistently showed dilation to *adult women*

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Image artefact or Biological mechanism?
Experiment 1: Discussion

95% of men's pupils dilated more to women than girls

Heterosexual males consistently showed dilation to adult women

Heterosexual females showed dilation to both adult men and women

Support for biological mechanism:
- Bailey (2009)
- Baumeister (2000)
- Suschinsky et al (2009)
Experiment 2

- Non-deviant males

- Diverse sexual interests (straight, gay, bi)

- Stimuli: Natural Scenes (as Experiment 1)
  Range of stages of sexual development
Experiment 2: Procedure

100 male participants (59 straight, 20 gay, 21 bi)

Rating 1-7 Likert Scale: ‘How sexually appealing do you find the person in the image?’
Experiment 2: Stimuli
(set 1 – Natural Scenes)
Experiment 2: Stimuli
(set 2 – Not Real People)
Experiment 2: Results
(set 1 – Natural Scenes)

$p \leq 0.01 \ast, p \leq 0.01\ast\ast, p \leq 0.001\ast\ast\ast$

(alpha corrected at $p < 0.0125$)
Experiment 2: Results
(set 1 – Natural Scenes)

$p \leq 0.01 \ast, p \leq 0.01 \ast\ast, p \leq 0.001 \ast\ast\ast$

(alpha corrected at $p < 0.0125$)
Experiment 2: Results (set 1 – Natural Scenes)

$p \leq 0.01\,*$, $p \leq 0.01\,**$, $p \leq 0.001\,***$

$(\alpha \text{ corrected at } p < 0.0125)$
Experiment 2: Results
(set 1 – Natural Scenes)

$p \leq 0.01^*, p \leq 0.01^{**}, p \leq 0.001^{***}$

($\alpha$ corrected at $p < 0.0125$)
Experiment 2: Results
(set 1 – Natural Scenes)

Correlations of pupil change and sexual appeal ratings:

Heterosexual, $r_s(226) = 0.60, p < 0.001$

Homosexual, $r_s(78) = 0.56, p < 0.001$

Bisexual men, $r_s(74) = 0.53, p < 0.001$

$p \leq 0.01 \ast, p \leq 0.01 \ast\ast, p \leq 0.001 \ast\ast\ast$

(alpha corrected at $p < 0.0125$)
Experiment 2: Results
(set 2 – Not Real People)

$p \leq 0.01^*, p \leq 0.001^{**\text{*}}, p \leq 0.001^{***}$

(alpha corrected at $p < 0.005$)
Experiment 2: Results
(set 2 – Not Real People)

$\text{Homosexual Male Observers}$

$p \leq 0.01^*, p \leq 0.01^{**}, p \leq 0.001^{***}$

(alpha corrected at $p < 0.0125$)
Experiment 2: Results
(set 2 – Not Real People)

Correlations of pupil change and sexual appeal ratings:
- Heterosexual, $r_s(568) = 0.24, p < 0.001$
- Homosexual, $r_s(198) = 0.26, p < 0.001$
- Bisexual men, $r_s(188) = 0.27, p < 0.001$

$p \leq 0.01 \ast, p \leq 0.01\ast\ast, p \leq 0.001\ast\ast\ast$ (alpha corrected at $p < 0.0125$)
Experiment 2: Discussion

Pupil dilation consistent with sexual orientation (i.e., largest pupil size observed for preferred gender)

Pupil dilation consistent with appropriate sexual age preferences (i.e. adults)
Experiment 2: Discussion

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Change in pupil size for specific categories correlated with sexual appeal ratings
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When viewing the NRP images, pupils dilated more for preferred gender, and to some extent also to age groups

Attard, Bindemann, & Ó Ciardha (in prep)
Experiment 2: Discussion

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Conclusions and Future Directions

Potential for pupil responses to measure sexual interests in a non-offending population
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Determine optimal stimuli for measuring sexual interests with pupil size
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Determine optimal stimuli for measuring sexual interests with pupil size

Compare pupil responses with other indirect measures of sexual interest (IAT, P-MST, CRT) (Ó Ciardha,Bindemann & Attard, in prep)
Pupil dilation consistent with appropriate age-preferences in a non-deviant population
Can pupil dilation indicate inappropriate sexual age preferences in a deviant population?
Measuring age-specific sexual preferences with pupil dilation

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