



GSA 2019

ANNUAL SCIENTIFIC MEETING

Strength in Age: Harnessing the Power of Networks

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Viewing time and facial trustworthiness perception

Giving it a second thought may not work for older
adults

Yi Lu

School of Psychological and Cognitive Sciences

Nov. 16th, 2019

Peking University

TRUSTWORTHINESS EVALUATION FOR OLDER ADULTS

A stranger knocked and stand at the door ...



TRUSTWORTHINESS EVALUATION FOR OLDER ADULTS

A stranger knocked and stand at the door ...



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TRUSTWORTHINESS EVALUATION FOR OLDER ADULTS

A stranger knocked and stand at the door ...



Older adults tend to trust untrustworthy faces (Castle et al., 2012; Zebrowitz et al., 2013)



WHY THEY TRUST A FACE AT THE FIRST GLANCE?



WHY THEY TRUST A FACE AT THE FIRST GLANCE?

Facial trustworthiness evaluation depends on emotional cues besides structural cues

Extremely trustworthy faces show positive affective valence (Krumhuber et al., 2007), while less trustworthy faces look negative (Hess et al., 2000; Montepare et al., 2003).

As the untrustworthiness of faces increased so did the amygdala response (Todorov, Baron, & Oosterhof, 2008).

Older adults pay more attention on and memorize more positive information

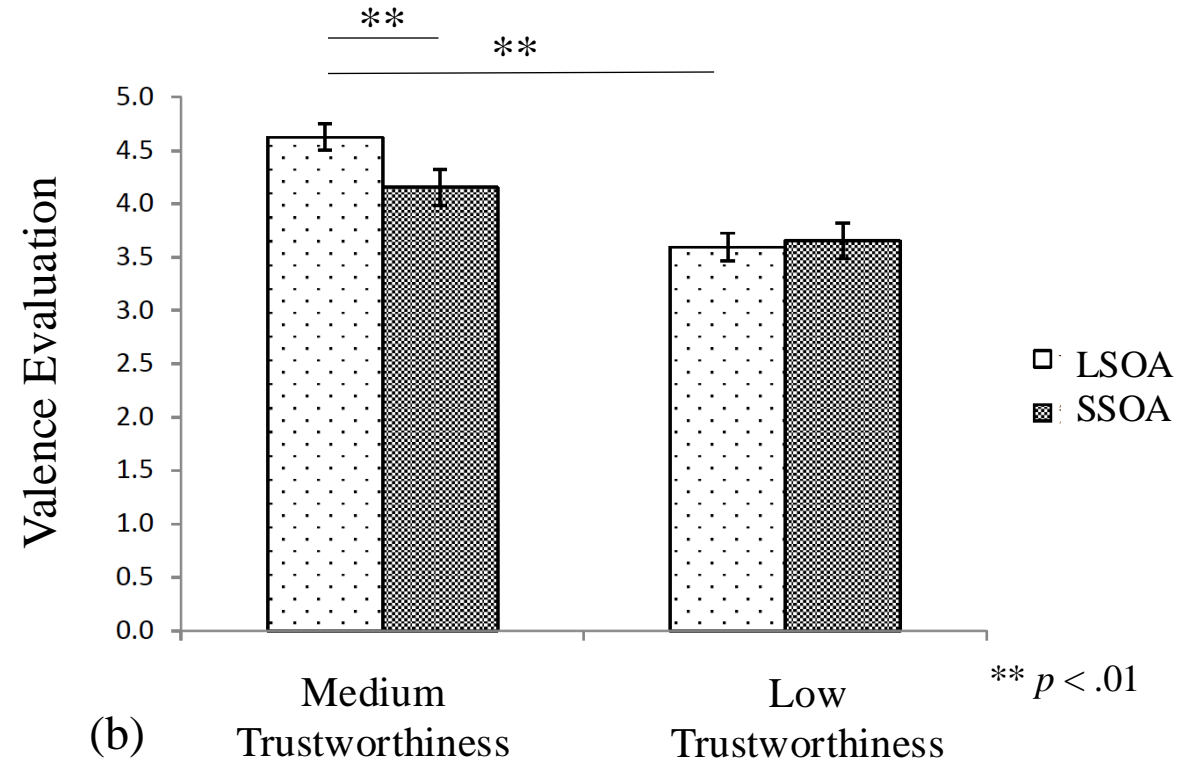
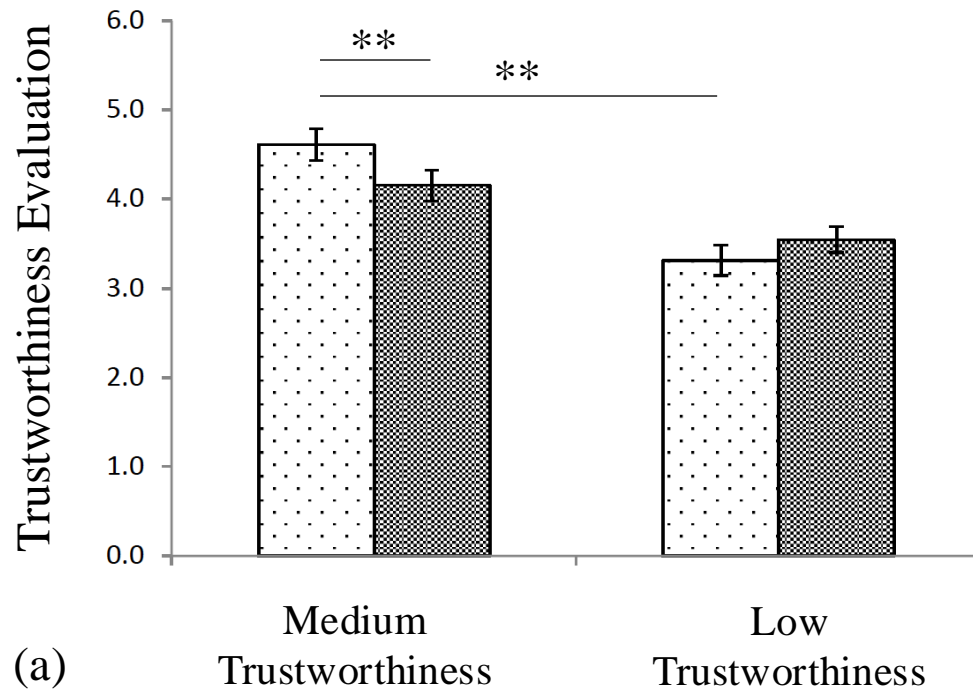
Positivity Effect (Mather & Carstensen, 2005)

Socioemotional Selectivity Theory (Carstensen, 1991)

Positivity processing preference may render older adults to be susceptible to strangers



HOW THEY TRUST A FACE AT THE FIRST GLANCE?



HOW THEY TRUST A FACE AT THE FIRST GLANCE?

Older adults use cognitive control to switch attention from negative to positive information

Older adults use cognitive control to decrease their attention towards negative information and increase towards positive information (Mather & Carstensen, 2005; Isaacowitz et al., 2008; Knight et al., 2007).

Cognitive control takes reaction time to shift attention from negative information to positive information (Isaacowitz et al., 2009; Nummenmaa et al., 2006).

Positivity processing preference requires reaction time

Positivity effect in facial trustworthiness evaluation increases with viewing time.

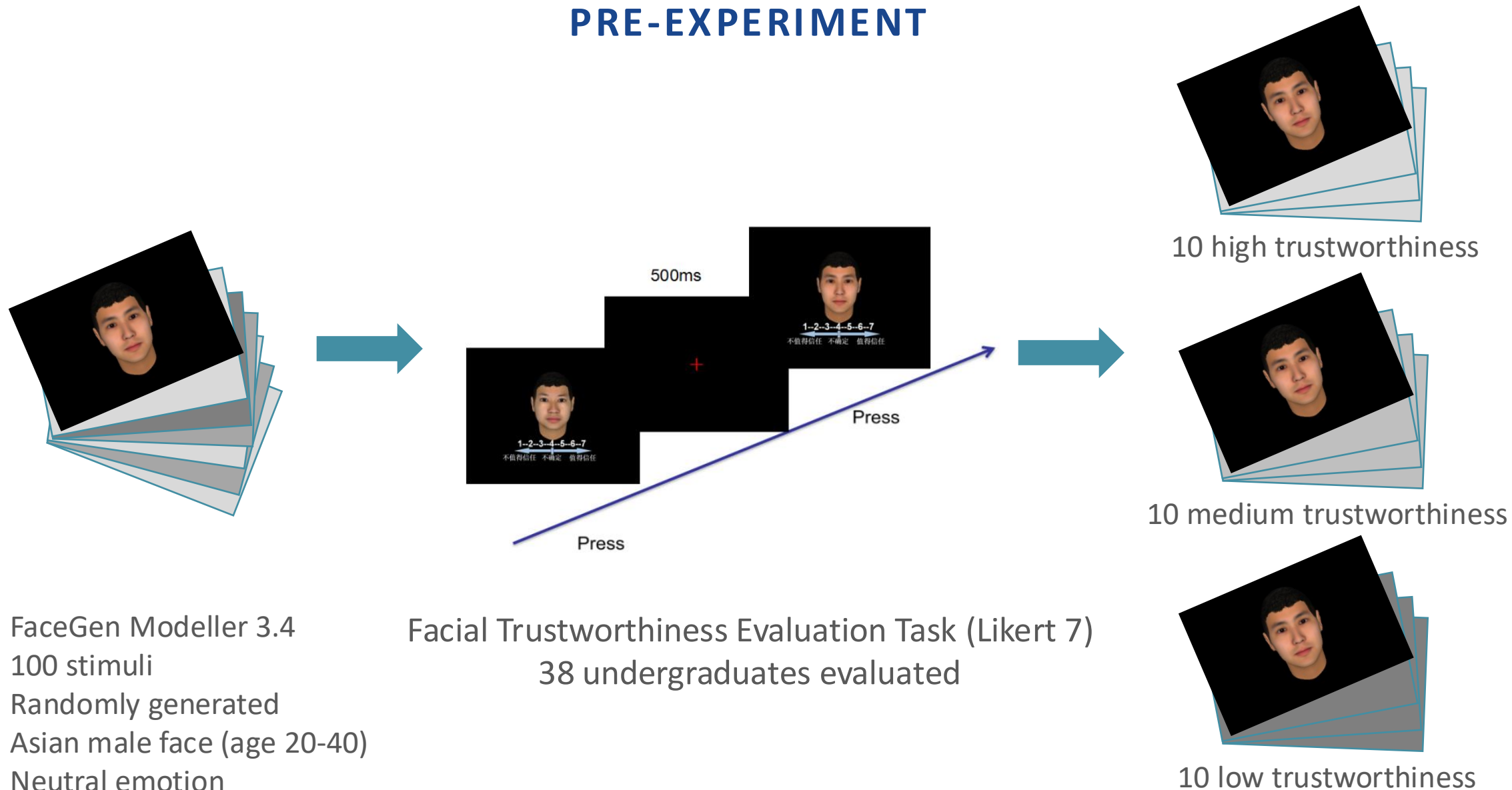


HYPOTHESES

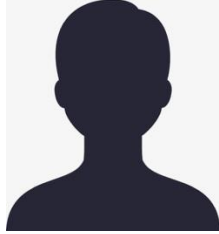
- For young adults, no viewing effect exists on trustworthiness evaluation;
- For old adults, viewing effect exists: both valence and trustworthiness evaluations rise as viewing time increases.



PRE-EXPERIMENT



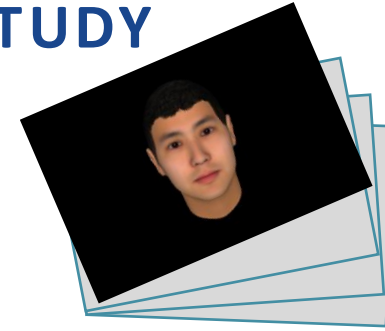
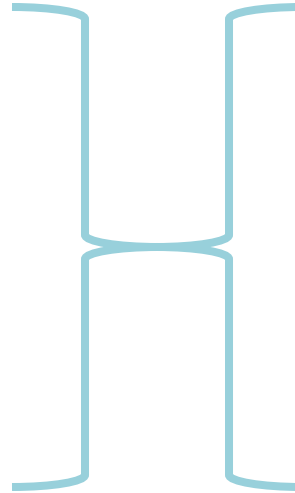
EXPERIMENT 1-CORRELATION STUDY



30 young participants
Age 20.53 (1.61)
50% Female



30 older participants
Age 63.27 (3.14)
50% Female



10 high trustworthiness



10 medium trustworthiness



10 low trustworthiness



EXP1 RESULTS

Exp1: Descriptions on demographic, cognitive and trustworthiness evaluation data [M (SD)]

	<i>Young (N = 30)</i>	<i>Old (N = 30)</i>
Age	20.53 (1.61)	63.27 (3.14)
Gender (female %)	50%	43%
Education level**	4.00 (.00)	2.90 (.61)
Health**	3.37 (.93)	2.57 (.94)
Income	4.27 (1.11)	4.13 (1.14)
Digital span-forward**	8.53 (.57)	6.83 (1.23)
Digital span-backward**	6.33 (1.27)	4.73 (1.55)
Digit-Symbol**	47.17 (6.19)	25.30 (4.43)
Language fluency**	18.37 (2.57)	14.83 (3.20)
High-trustworthiness	4.85 (.81)	5.01 (.71)
Medium-trustworthiness*	3.87 (.81)	4.23 (.78)
Low-trustworthiness	2.83 (.81)	3.19 (.94)

* $p < .05$, ** $p < .01$



HIERARCHICAL LINEAR MODELING

Level 1: Picture level

(TE: Trustworthiness Evaluation; RT: Reaction Time)

$$TE = \beta_0 + \beta_1 * RT + r_{ij}$$

Level 2: Individual level

$$\begin{aligned} \beta_0 = & \gamma_{00} + \gamma_{01} * \text{Age} + \gamma_{02} * \text{Df} + \gamma_{03} * \text{Db} + \gamma_{04} * \text{DSS} + \gamma_{05} * \text{LF} \\ & + \gamma_{06} * \text{Gender} + \gamma_{07} * \text{Edu} + \gamma_{08} * \text{Health} + \gamma_{09} * \text{Income} + u_{0j} \end{aligned}$$

$$\beta_1 = \gamma_{10} + \gamma_{11} * \text{Age} + u_{1j}$$



EXP1 RESULTS

Exp1: Hierarchical Linear Modeling Output on Facial Trustworthiness Evaluation [B (SE)]

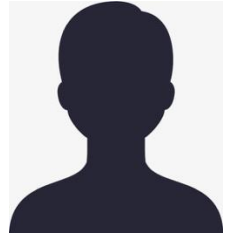
	<i>Trustworthiness Evaluation</i>
Intercept (γ_{00})	3.98 (.09)**
Age (γ_{01})	.24 (.33)
Digital span-forward (γ_{02})	-.10 (.10)
Digital span-backward (γ_{03})	.01 (.05)
Digital-Symbol (γ_{04})	-.00 (.01)
Language fluency (γ_{05})	.05 (.02)*
Gender (γ_{06})	-.16 (.15)
Education level(γ_{07})	.18 (.21)
Health (γ_{08})	-.15 (.07)*
Income (γ_{09})	-.10 (.06)
Reaction Time	
Intercept (γ_{10})	.008 (.003)*
Age (γ_{20})	-.005 (.007)
ICC	.15

$t = 2.54, p = .01$, viewing time effect

* $p < .05$, ** $p < .01$



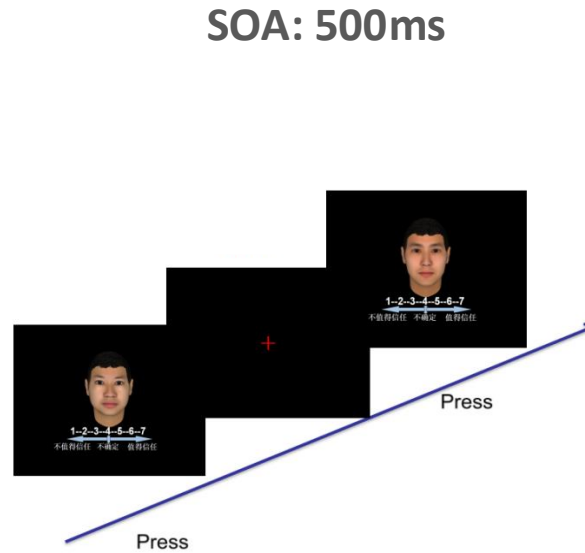
EXPERIMENT 2-CAUSALITY STUDY



28 young participants
Age 23.93(2.68)
50% Female



30 older participants
Age 64.47 (4.32)
50% Female



SOA: 3000ms

22



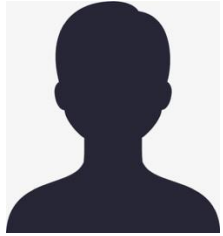
10 medium trustworthiness



10 low trustworthiness



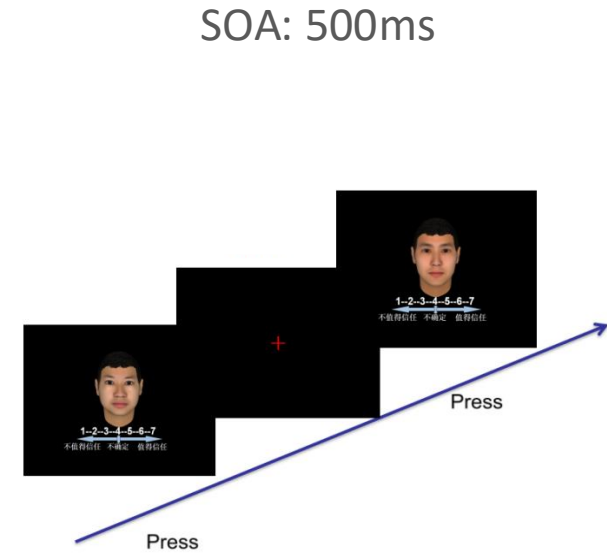
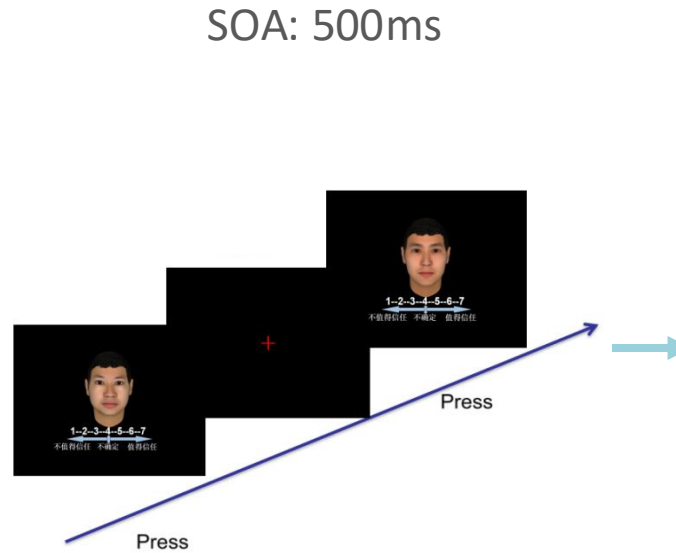
EXPERIMENT 2-CAUSALITY STUDY



28 young participants
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50% Female



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Age 64.47 (4.32)
50% Female



SOA: 3000ms

SOA: 3000ms

Valence Evaluation Task (Likert 7)



EXP2 RESULTS

Mixed-model ANOVA (Age * Trustworthiness * SOA) on Trustworthiness Evaluation

$$F(1, 56) = 6.00, p = .02, \eta^2_{\text{partial}} = .10$$

Repeated-measure ANOVA (Trustworthiness * SOA)

For Young: Main effect on Trustworthiness $F(1, 27) = 26.81, p < .01, \eta^2_{\text{partial}} = .71$

No effect on SOA



EXP2 RESULTS

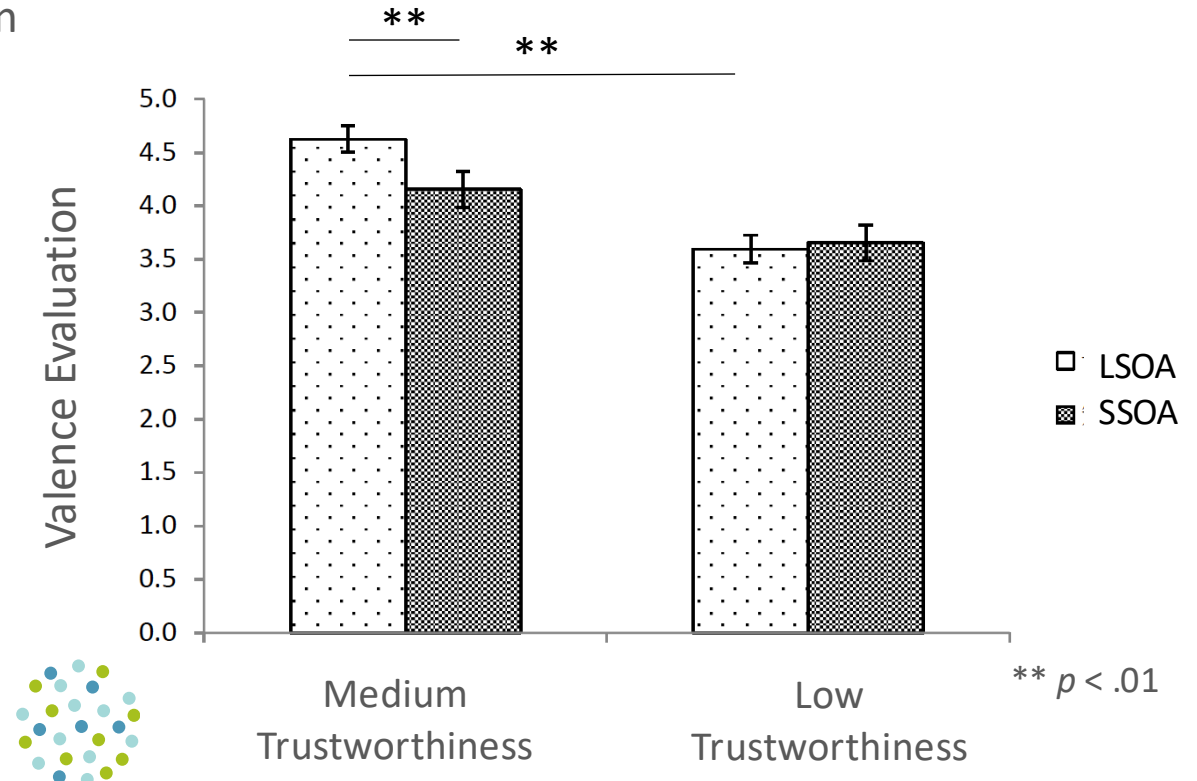
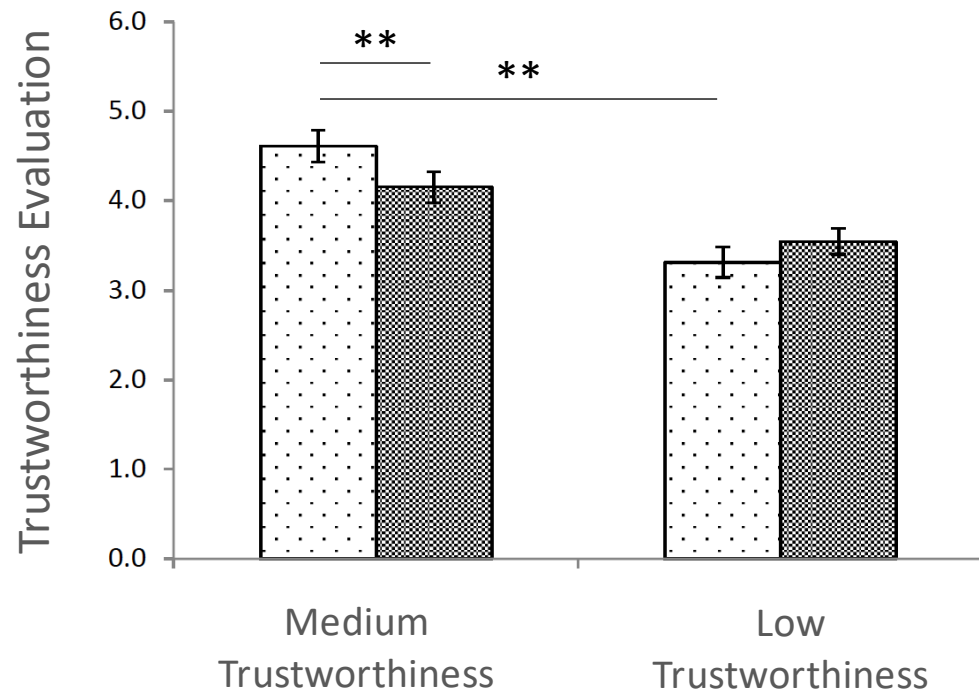
Repeated-measure ANOVA on Trustworthiness Evaluation

For Old: Interaction effect $F(1, 29) = 22.08, p < .01, \eta^2_{\text{partial}} = .43$

SOA main effect on medium trustworthiness pictures $F(1, 29) = 8.39, p < .01, \eta^2_{\text{partial}} = .22$

Also on medium trustworthiness valence $F(1, 29) = 17.98, p < .01, \eta^2_{\text{partial}} = .38$

Similar pattern on Valence Evaluation



DISCLOSURES

DISCLOSURE 1

Older adults trusted more when viewing medium trustworthiness faces than younger adults

DISCLOSURE 2

Only in older adults did valence evaluation influence trustworthiness evaluation

DISCLOSURE 3

Only when given shorter viewing time did older adults exhibit accurate facial trustworthiness ratings as younger adults



CO-AUTHORS

Xu Ye, MS

School of Psychological and Cognitive Sciences, Peking University

Yin Xiaowei, MS

School of Psychological and Cognitive Sciences, Peking University

Zhang Xin, Ph.D

School of Psychological and Cognitive Sciences, Peking University



北京大学心理与认知科学学院

School of Psychological and Cognitive Sciences, Peking University



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THANK YOU

E-mail: loewe_luyi@pku.edu.cn



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REFERENCE

- Carstensen, L. L. (1991). Selectivity theory: Social activity in life-span context. *Annual review of gerontology and geriatrics*, 11(1), 195-217.
- Castle, E., Eisenberger, N. I., Seeman, T. E., Moons, W. G., Boggero, I. A., Grinblatt, M. S., & Taylor, S. E. (2012). Neural and behavioral bases of age differences in perceptions of trust. *Proceedings of the National Academy of Sciences*, 109(51), 20848-20852.
- Hess, U., Blairy, S., & Kleck, R. E. (2000). The influence of facial emotion displays, gender, and ethnicity on judgments of dominance and affiliation. *Journal of Nonverbal behavior*, 24(4), 265-283.
- Isaacowitz, D. M., Toner, K., Goren, D., & Wilson, H. R. (2008). Looking while unhappy: Mood-congruent gaze in young adults, positive gaze in older adults. *Psychological Science*, 19(9), 848-853.
- Isaacowitz, D. M., Allard, E. S., Murphy, N. A., & Schlangel, M. (2009). The time course of age-related preferences toward positive and negative stimuli. *Journals of Gerontology: Series B*, 64(2), 188-192.
- Knight, M., Seymour, T. L., Gaunt, J. T., Baker, C., Nesmith, K., & Mather, M. (2007). Aging and goal-directed emotional attention: distraction reverses emotional biases. *Emotion*, 7(4), 705.
- Krumhuber, E., Manstead, A. S., Cosker, D., Marshall, D., Rosin, P. L., & Kappas, A. (2007). Facial dynamics as indicators of trustworthiness and cooperative behavior. *Emotion*, 7(4), 730.
- Mather, M., & Carstensen, L. L. (2005). Aging and motivated cognition: The positivity effect in attention and memory. *Trends in cognitive sciences*, 9(10), 496-502.
- Nummenmaa, L., Hyönä, J., & Calvo, M. G. (2006). Eye movement assessment of selective attentional capture by emotional pictures. *Emotion*, 6(2), 257.
- Reed, A. E., & Carstensen, L. L. (2012). The theory behind the age-related positivity effect. *Frontiers in psychology*, 3, 339.
- Todorov, A., Baron, S. G., & Oosterhof, N. N. (2008). Evaluating face trustworthiness: a model based approach. *Social cognitive and affective neuroscience*, 3(2), 119-127.
- Zebrowitz, L. A., Franklin Jr, R. G., Hillman, S., & Boc, H. (2013). Older and younger adults' first impressions from faces: Similar in agreement but different in positivity. *Psychology and aging*, 28(1), 202.



EXP2 RESULTS

Exp2: Descriptions on demographic, cognitive, trustworthiness and valence evaluation data [M (SD)]

	<i>Young (N = 28)</i>	<i>Old (N = 30)</i>
Age	23.93 (2.68)	64.47 (4.32)
Gender (female %)	50%	50%
Education level**	3.64 (.49)	2.83 (.79)
Health**	3.39 (1.03)	2.77 (.95)
Income	4.36 (1.31)	4.47 (1.17)
Digital span-forward**	8.36 (.56)	7.80 (.89)
Digital span-backward**	6.25 (1.27)	4.90 (1.61)
Digit-Symbol**	46.96 (6.50)	26.10 (6.83)
Language fluency**	19.36 (3.01)	16.53 (2.84)
Medium TE & LSOA	4.31 (.81)	4.61 (.98)
Low TE & LSOA	3.26 (.80)	3.31 (.95)
Medium TE & SSOA	4.11 (.90)	4.15 (.94)
Low TE & SSOA	3.19 (.86)	3.54 (.81)
Medium VE & LSOA	4.39 (.91)	4.63 (.68)
Low VE & LSOA	3.29 (.80)	3.59 (.92)
Medium VE & SSOA*	3.67 (.88)	4.15 (.71)
Low VE & SSOA	3.38 (.99)	3.65 (.91)

* $p < .05$, ** $p < .01$

TE: Trustworthiness Evaluation, VE: Valence Evaluation

LSOA: Long Stimulus Onset Asynchrony, SSOA: Short Stimulus Onset Asynchrony



EXP2 RESULTS

Residual analysis:

Exp2: Residual Analysis between Trustworthiness and Valence Evaluations [*B* (*SE*)]

	<i>Young (N = 28)</i>	<i>Old (N = 30)</i>
Digital span-forward	-.03 (.44)	.24 (.24)
Digital span-backward	-.28 (.17)	.03 (.13)
Digit-Symbol	.02 (.03)	-.03 (.03)
Language fluency	.11 (.08)	.01 (.07)
Residual on Valence Evaluation	.54 (.53)	.51 (.22) *

* $p < .05$

$t = 2.32, p = .03$, valence
evaluation influence
trustworthiness evaluation

