Genetic Contributions to Attachment across the Life Course: Findings from the Minnesota Longitudinal Study of Risk and Adaptation

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Overview of the MLSRA

Sample

- Born between 1975 and 1977 to first-time mothers living in poverty

Research design

- Followed from birth to mid-adulthood
- Low attrition since early childhood

Genetic data collected at age 32

- No diff's in DNA (*n* = 158) and attrition subsamples

Research questions

Origins of infant attachment

Do genetic variations contribute to attachment security and/or specific attachment behaviors?

Stability and change in attachment security across development

Are there genetic contributions to the continuity of attachment security after infancy?

Genetic and caregiving-based contributions to infant attachment: Unique associations with distress reactivity and attachment security

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Background

- Temperament vs. attachment: an old debate

- A possible resolution: *temperament influences type of (in)security during the SSP*
  - Use sub-classifications to group infants according to their distress reactivity (Thompson & Lamb, 1984)
    - Low distress: A_1-B_2
    - High distress: B_3-C_1
  - Infant temperament predicts distress reactivity but not security vs. insecurity (Belsky & Rovine, 1987)

Research questions

Does infant's genotype predict distress reactivity during the SSP?

- Serotonin transporter VNTR (5HTTLPR)
  - "short" allele associated with increased risk for depression and temperamental difficulty in early childhood (Caspi et al., 2010; Cutuli et al., in press)

Does 5HTTLPR predict attachment security?

- Short allele may interact with maternal responsiveness to predict security (Barry et al., 2008)

Measures

Maternal responsiveness

- Home observations during feeding and play interactions at 6 months

5HTTLPR

- 56 l/l, 68 s/l, 31 s/s

Strange Situation at 12m and 18m

- Classified as secure (B) vs. insecure (A or C)
- Classified as high (B_3–C_2) or low distress (A_1–B_2)

Results: Attachment security

Predictor	12 months		
	Total sample	High-distress group	Low-distress group
5-HTTLPR	0.01 (0.25)	0.18 (0.41)	0.01 (0.35)
Maternal responsiveness	0.35 (0.13)**	0.24 (0.20)	0.43 (0.17)*
5-HTTLPR × Responsiveness	−0.07 (0.17)	−0.01 (0.28)	−0.10 (0.25)

Predictor	18 months		
	Total sample	High-distress group	Low-distress group
5-HTTLPR	0.15 (0.26)	−0.31 (0.40)	0.60 (0.38)
Maternal responsiveness	0.21 (0.13)†	0.41 (0.21)*	0.03 (0.18)
5-HTTLPR × Responsiveness	−0.10 (0.17)	−0.33 (0.31)	0.02 (0.24)

Results: Distress reactivity

Predictor	12 months: Total sample	12 months: Securely attached group	12 months: Insecurely attached group
5-HTTLPR	0.71 (0.25)**	0.76 (0.34)*	1.49 (0.76)*
Maternal responsiveness	0.07 (0.12)	0.03 (0.15)	0.18 (0.22)
5-HTTLPR × Responsiveness	0.06 (0.16)	0.09 (0.21)	0.04 (0.52)

Predictor	18 months: Total sample	18 months: Securely attached group	18 months: Insecurely attached group
5-HTTLPR	0.08 (0.25)	−0.22 (0.32)	0.69 (0.48)†
Maternal responsiveness	0.19 (0.12)	0.31 (0.15)	−0.12 (0.25)
5-HTTLPR × Responsiveness	0.12 (0.17)	0.05 (0.21)	0.71 (0.46)

Conclusions

- Infant attachment security as a relationship construct
- Failure to replicate Barry et al., (2008)
  - 5HTTLPR did not significantly moderate the association between responsiveness and security
  - Sample differences or Type-1 error?
- Potential genetic contributions to infants' distress during SSP
  - 5HTTLPR may bias toward attachment classifications that reflect infants' reactions to distressing events

Genetic contributions to continuity and change in attachment security: A prospective, longitudinal investigation from infancy to young adulthood

Background

- Modest stability in attachment security from infancy to young adulthood (Fraley, 2002)

- Individual characteristics as potential moderators of the continuity of attachment security (Thompson, 2006; Waters et al., 2000).

- Reiner & Spangler (2010)
  - DRD4 moderates associations between adults' retrospective reports of childhood caregiving experiences and adult attachment security

Research question

Does genetic variation moderate the stability of attachment security from infancy to young adulthood?

Measures

Infant attachment security

- % of times securely attached at 12m and 18m

Genetic variation

- 5HTTLPR VNTR, DRD4 VNTR, and OXTR rs53576

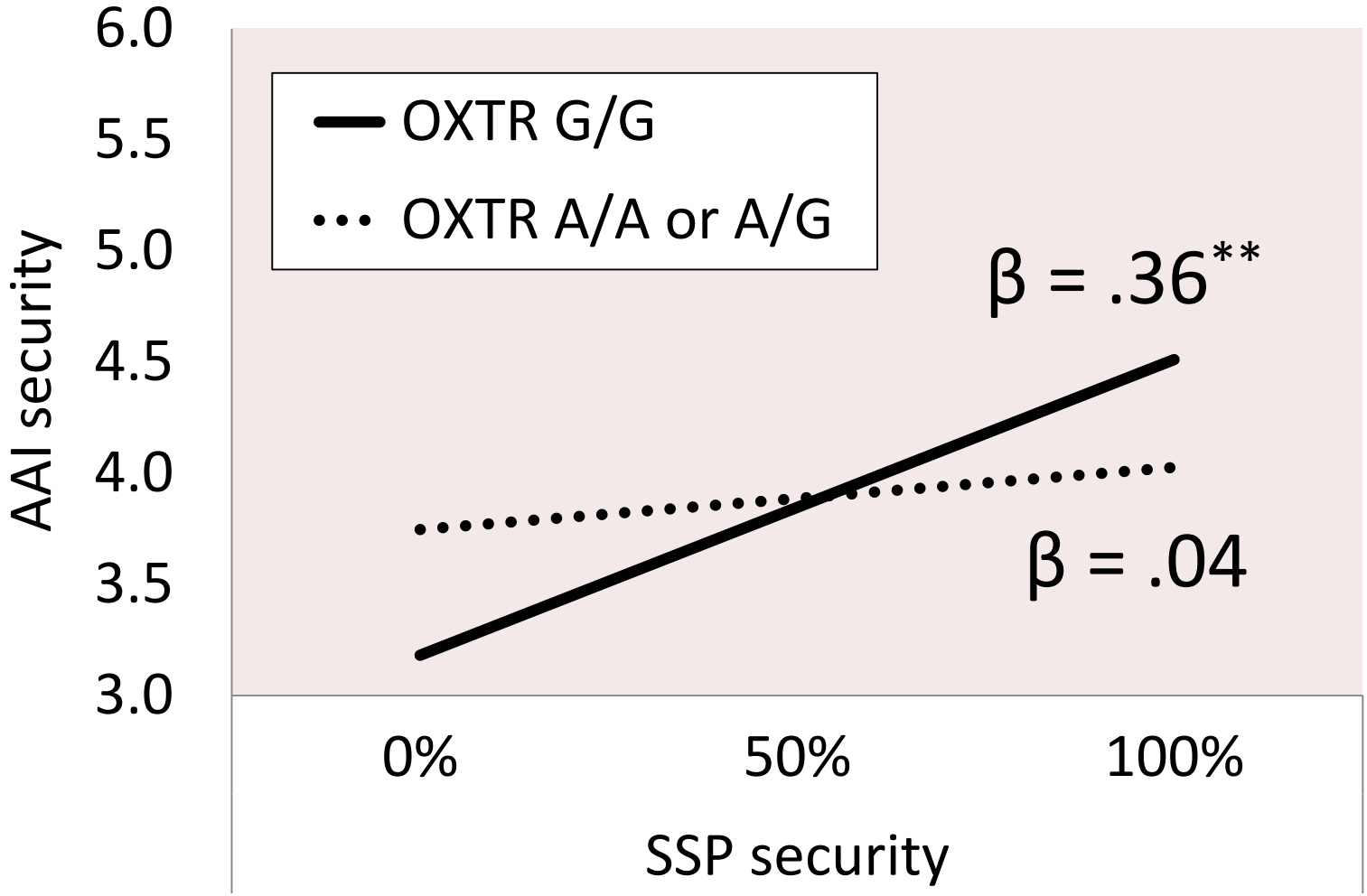
Adult attachment security

- Adult Attachment Interview: age 19 and age 26
- Current Relationship Interview: 20-21 and 26-28

Results: AAI at age 19

Main effects	β	*p*
SSP security	.19	.02
OXTR	.02	.92
DRD4	-.10	.32
5HTT	.11	.26
Interactive effects	β	*p*
SSP x OXTR	**.18**	**.02**
SSP x DRD4	.08	.45
SSP x 5HTT	.23	.01

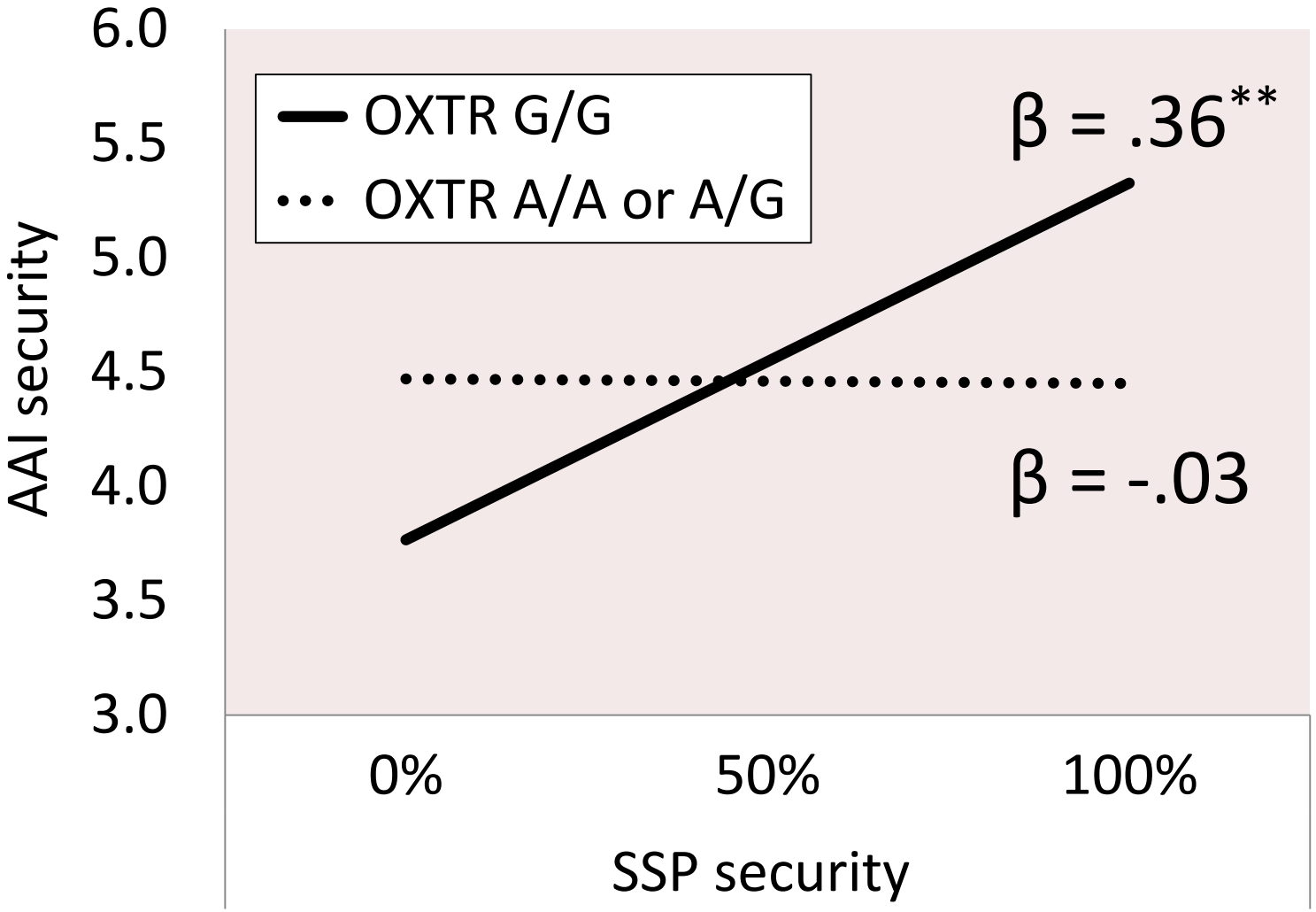
Results: AAI at age 19



Results: AAI at age 26

Main effects	β	*p*
SSP security	.13	.11
OXTR	.04	.66
DRD4	.13	.12
5HTT	.02	.85
Interactive effects	β	*p*
SSP x OXTR	**.19**	**.02**
SSP x DRD4	.16	.14
SSP x 5HTT	-.01	.75

Results: AAI at age 26



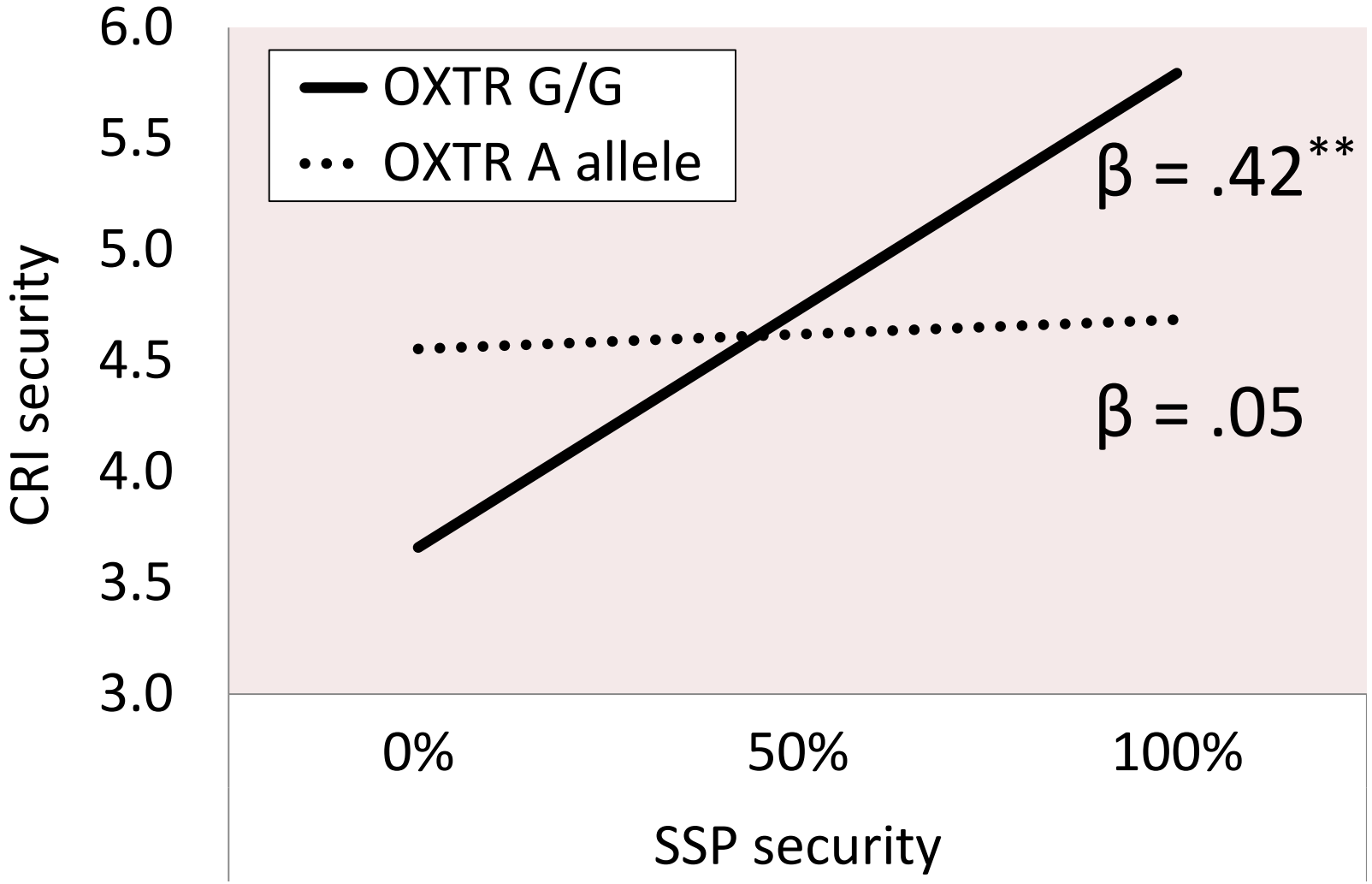
CRI at ages 20–21

Main effects	β	*p*
SSP security	.09	.45
OXTR	-.11	.32
DRD4	-.11	.34
5HTT	.02	.86
Interactive effects	β	*p*
SSP x OXTR	.12	.12
SSP x DRD4	-.17	.17
SSP x 5HTT	-.15	.20

CRI at ages 26–28

Main effects	β	*p*
SSP security	.17	.17
OXTR	.05	.67
DRD4	.06	.66
5HTT	-.11	.37
Interactive effects	β	*p*
SSP x OXTR	**.23**	**.03**
SSP x DRD4	.05	.72
SSP x 5HTT	-.01	.98

CRI at ages 26–28



Conclusions

- Potential role for genetically based sensitivity to change in attachment security
  - OXTR G/G → more likely to show continuity in security or insecurity
  - OXTR A allele → more likely to change
- Specific to OXTR
- Remaining questions
  - Does this replicate?
  - Biological and psychological mechanisms?

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