

Effect of age on human preferences and decision-making processes under risk and ambiguity

A. Tymula, L. Rosenberg Belmaker, A. Roy, L. Ruderman, K. Manson, P. Glimcher and I. Levy 

Motivation

1. What about the decision making process changes as people age?
2. Are there differences in decision making in the gain and loss domain?

Methods – Subjects

Age \ Gender	Female	Male	Total
12-17	17	16	33
21-25	18	16	34
30-50	17	15	32
65-90	18	18	36
Total:	70	65	135

Healthy subjects, recruited in New Haven, CT (71) and New York, NY (64)
 +65 year old subjects screened for dementia using the mini-mental state examination

Methods - Experiment

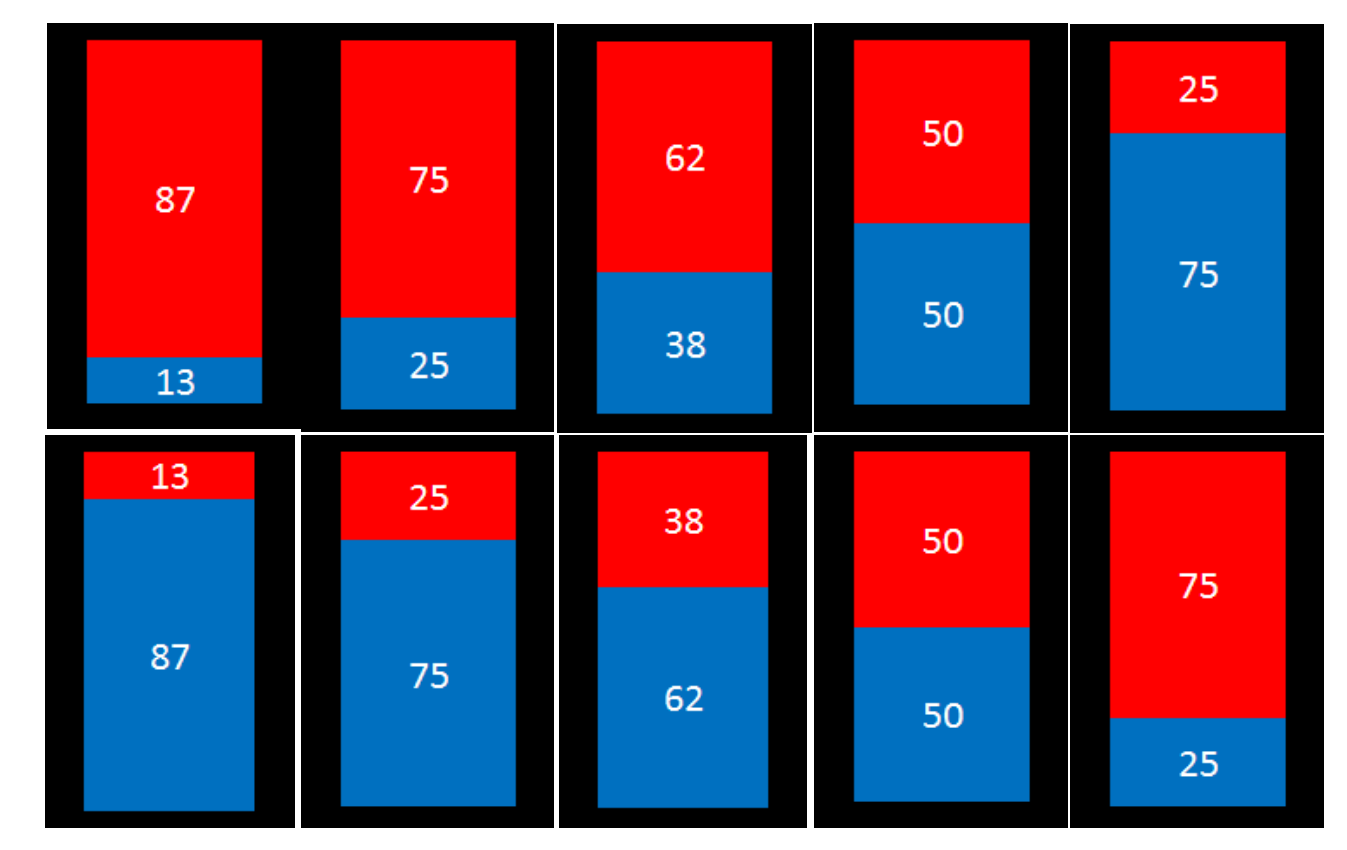
Choice task:



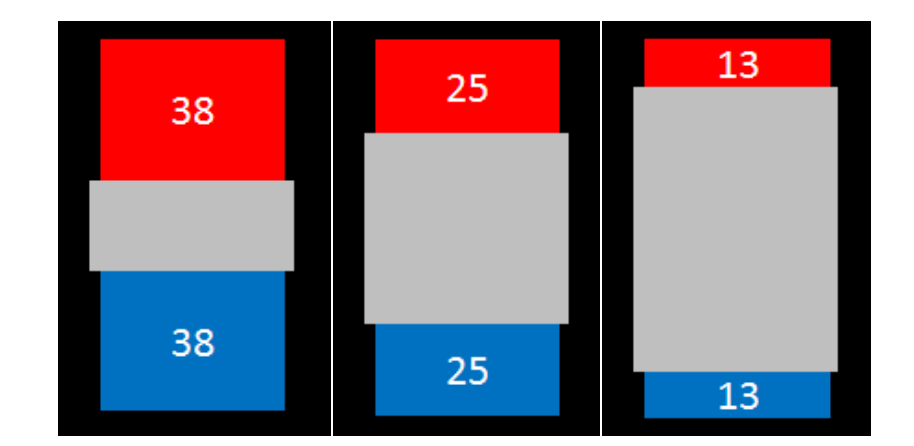
- Each decision repeated four times
- 320 choices per subject
- One choice randomly selected for payment

Lottery types:

Risky:



Ambiguous:



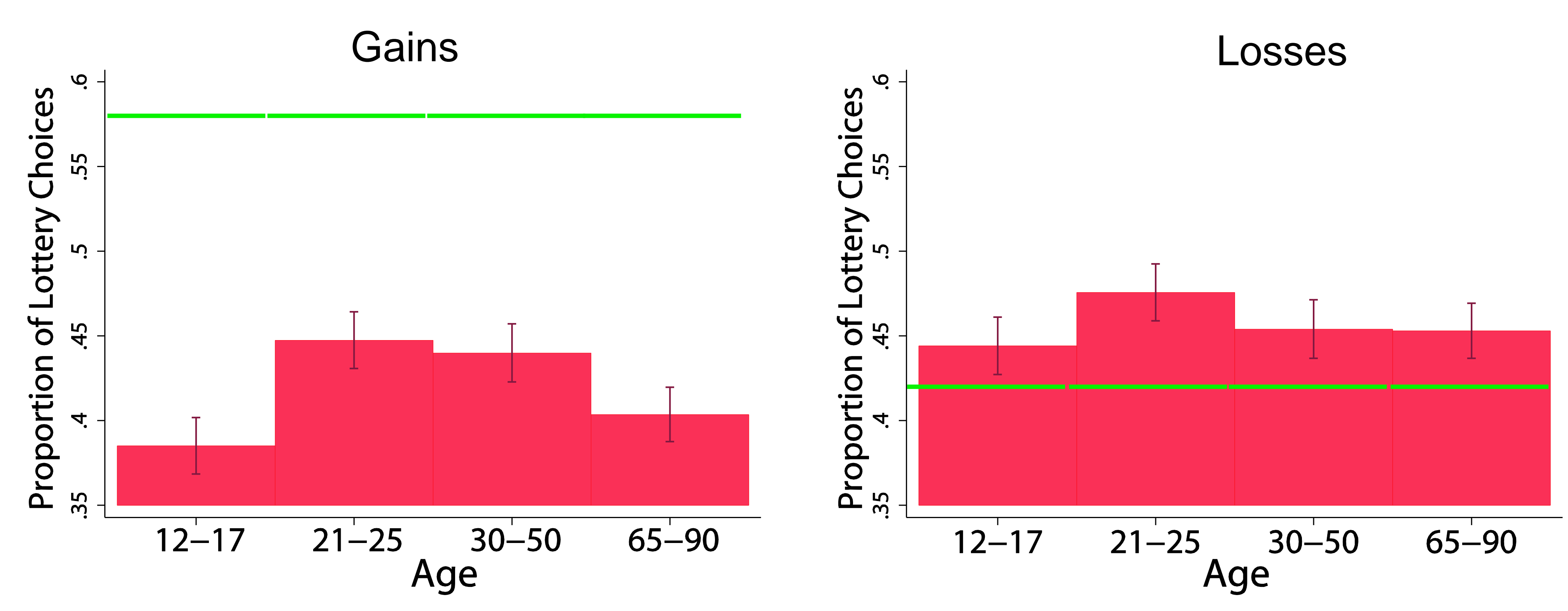
- Gain Amounts: \$5; \$8; \$20; \$50; \$125
- Loss Amounts: -\$125; -\$50; -\$20; -\$8; -\$5

Other data:

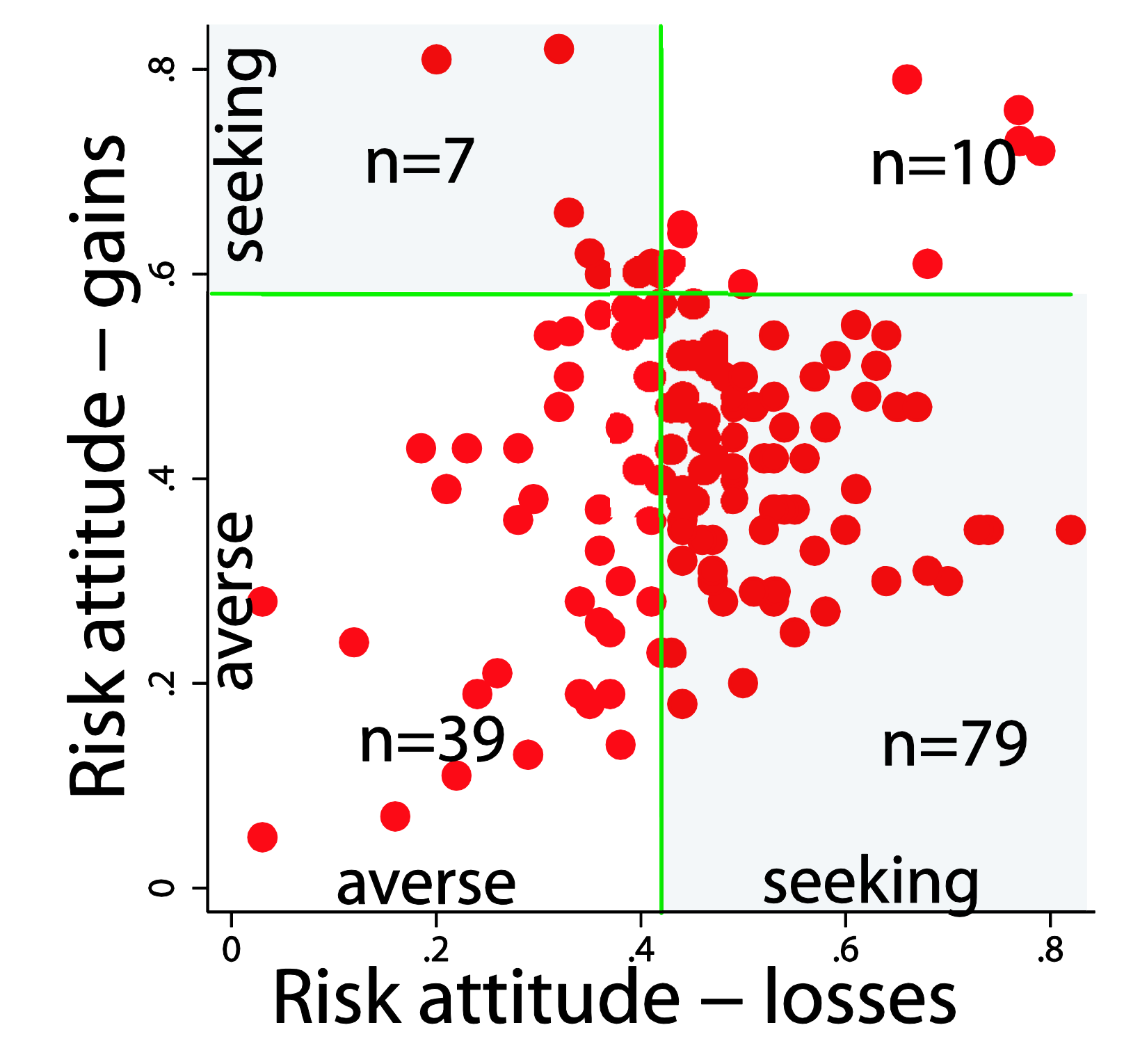
Extensive demographic information; IQ (KBIT2); numeracy; impulsivity estimate (BIS-11); risk aversion estimate (DOSPERT, ARQ); BIS/BAS scores

Results - risk aversion

1. Gains - adolescents and older adults were more risk averse
2. Losses - no age based differences



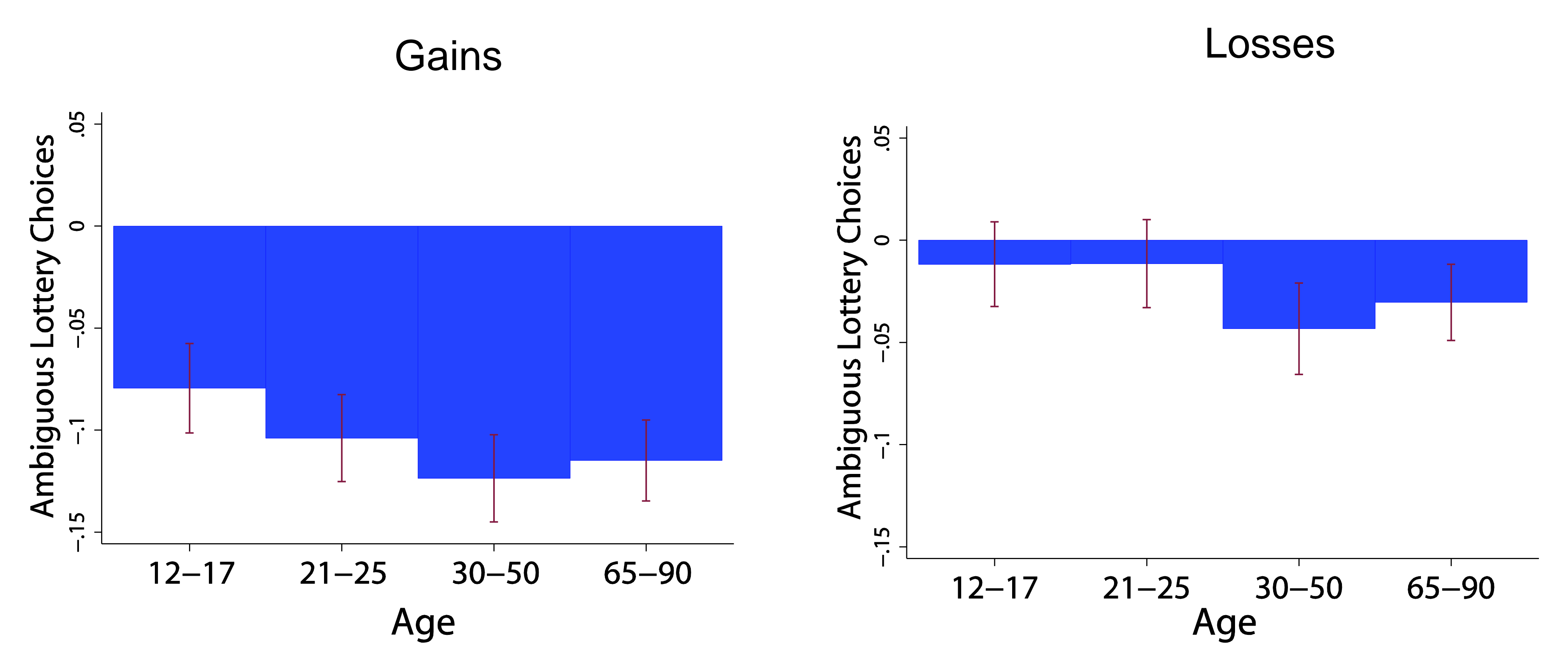
3. No evidence of correlation between individual risk attitudes in gains and losses



(Spearman's rho = 0.117
 p = 0.179)

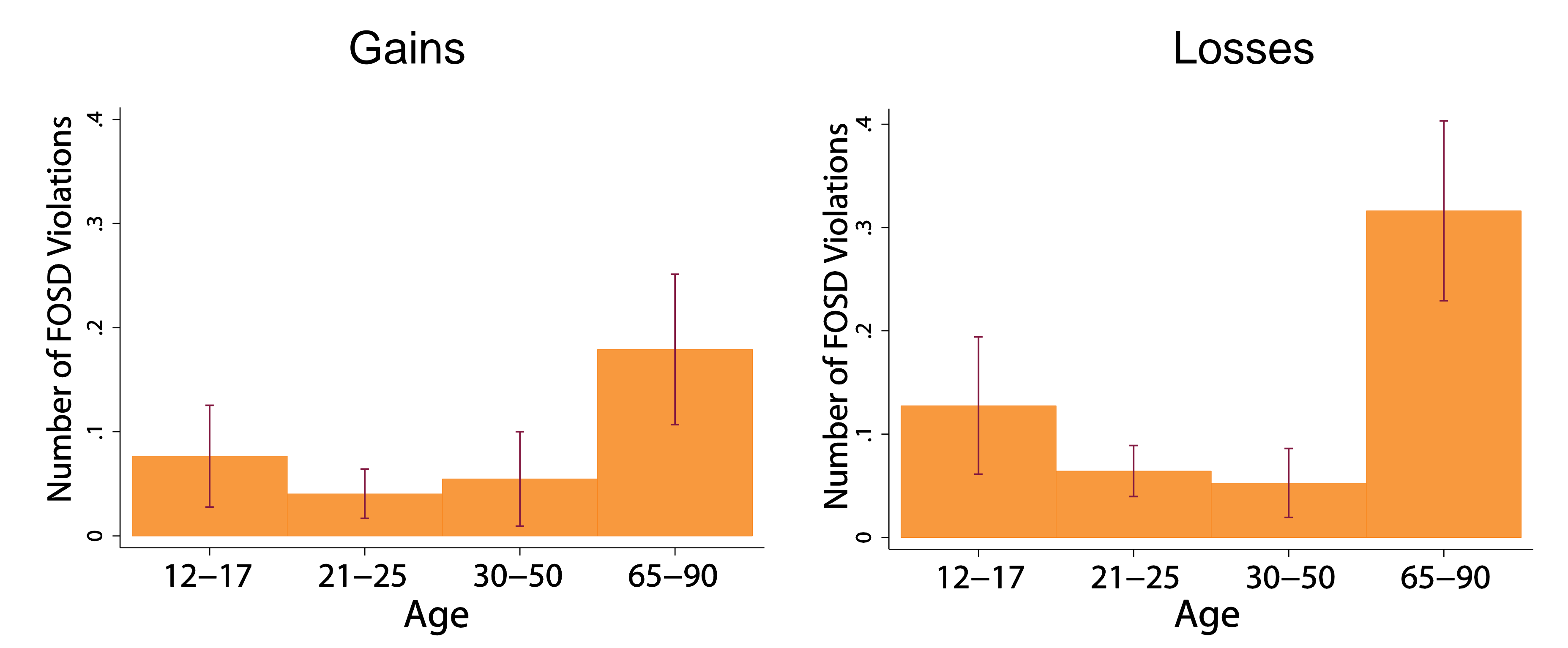
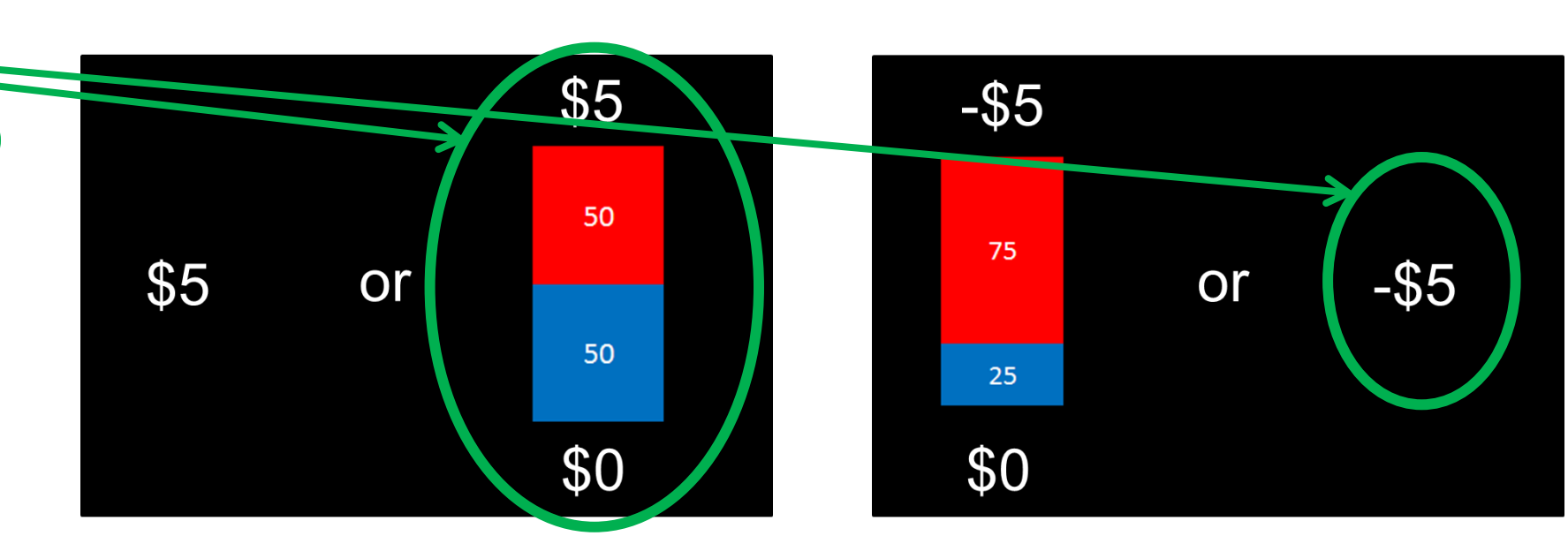
Results - ambiguity aversion

1. Gains - adolescents are the most ambiguity tolerant
2. Losses - no age based differences



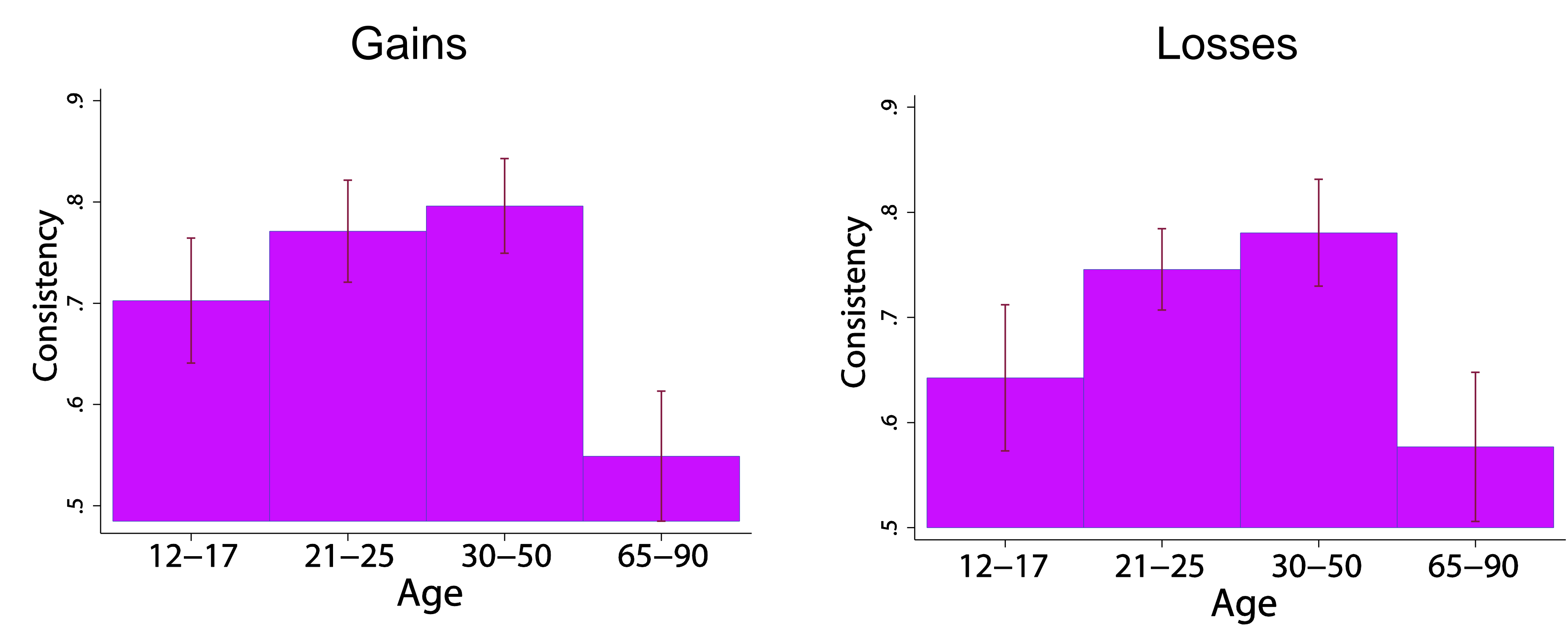
Results – “Irrationality”, dominance violations

1. Older adults select dominated options more often
2. Older adults select dominated option more often in losses than in gains



Results – Consistency / Stochasticity

1. Older adults are the least consistent in their decisions
2. There are no differences in consistency between gain and loss domain



Summary

1. Adolescents and older adults were more risk averse than young and midlife adults in the gains
2. There are no age based differences in the loss domain
3. There is no evidence of correlation between individual risk attitudes in gains and losses
4. Adolescents were the most ambiguity tolerant group in the gain domain
5. There were no age based differences in the loss domain
6. Older adults violate dominance most often
7. Older adults violate dominance more often in losses than in gains
8. Older adults are the least consistent in their decisions
9. There are no differences in consistency between gain and loss domain