# Explore Close Relationship Scale and Latent Class Analysis of Experience in Close Relationship

Yucheng Li (yl5215), Jiayi Shi (js6177), Ziqing Wang (zw2899), Yuchen Zheng (yz4183)
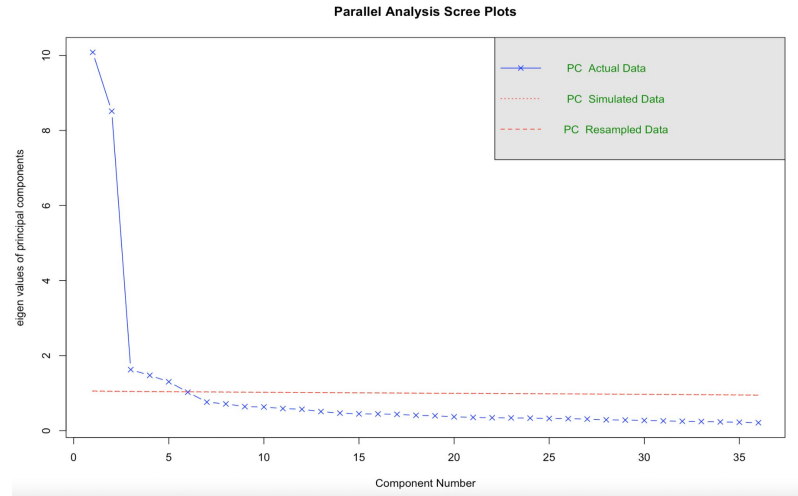
# Introduction

- Motivation: we want to explore the underlying dimensions of the scale and understand the adult romantic attachment styles, and lastly, provide insights into association between romantic styles and age, gender, and geographical residence
- Dataset contains 51591 responses to the Experiences in Close Relationships Scale. 38889 participants are used in our analysis.
- The scale contains 36 questions and 3 variables indicating the age, gender, country of the respondents
- A response to each question contains values from 0 to 5

| Field | Format | Description |
|---|---|---|
| Q1 | INTEGER | "I prefer not to show a partner how I feel deep down." rated on a five point scale (1-5; -1 if missed). 1 was labeled as "strongly disagree", 2 was labeled as "disagree", 3 was labeled as "neither agree nor disagree", 4 was labeled as "agree" and 5 was labeled as "strongly agree". |
| Q2 | INTEGER | "I worry about being abandoned." rated on a five point scale (1-5; -1 if missed). 1 was labeled as "strongly disagree", 2 was labeled as "disagree", 3 was labeled as "neither agree nor disagree", 4 was labeled as "agree" and 5 was labeled as "strongly agree". |
| Q3 | INTEGER | "I am very comfortable being close to romantic partners." rated on a five point scale (1-5; -1 if missed). 1 was labeled as "strongly disagree", 2 was labeled as "disagree", 3 was labeled as "neither agree nor disagree", 4 was labeled as "agree" and 5 was labeled as "strongly agree". |
| Q4 | INTEGER | "I worry a lot about my relationships." rated on a five point scale (1-5; -1 if missed). 1 was labeled as "strongly disagree", 2 was labeled as "disagree", 3 was labeled as "neither agree nor disagree", 4 was labeled as "agree" and 5 was labeled as "strongly agree". |
| Q5 | INTEGER | "Just when my partner starts to get close to me I find myself pulling away." rated on a five point scale (1-5; -1 if missed). 1 was labeled as "strongly disagree", 2 was labeled as "disagree", 3 was labeled as "neither agree nor disagree", 4 was labeled as "agree" and 5 was labeled as "strongly agree". |
| Q6 | INTEGER | "I worry that romantic partners wont care about me as much as I care about them." rated on a five point scale (1-5; -1 if missed). 1 was labeled as "strongly disagree", 2 was labeled as "disagree", 3 was labeled as "neither agree nor disagree", 4 was labeled as "agree" and 5 was labeled as "strongly agree". |
| Q7 | INTEGER | "I get uncomfortable when a romantic partner wants to be very close." rated on a five point scale (1-5; -1 if missed). 1 was labeled as "strongly disagree", 2 was labeled as "disagree", 3 was labeled as "neither agree nor disagree", 4 was labeled as "agree" and 5 was labeled as "strongly agree". |
| Q8 | INTEGER | "I worry a fair amount about losing my partner." rated on a five point scale (1-5; -1 if missed). 1 was labeled as "strongly disagree", 2 was labeled as "disagree", 3 was labeled as "neither agree nor disagree", 4 was labeled as "agree" and 5 was labeled as "strongly agree". |
| Q9 | INTEGER | "I don't feel comfortable opening up to romantic partners." rated on a five point scale (1-5; -1 if missed). 1 was labeled as "strongly disagree", 2 was labeled as "disagree", 3 was labeled as "neither agree nor disagree", 4 was labeled as "agree" and 5 was labeled as "strongly agree". |
| Q10 | INTEGER | "I often wish that my partner's feelings for me were as strong as my feelings for him/her." rated on a five point scale (1-5; -1 if missed). 1 was labeled as "strongly disagree", 2 was labeled as "disagree", 3 was labeled as "neither agree nor disagree", 4 was labeled as "agree" and 5 was labeled as "strongly agree". |

# Introduction

- Data Preparation:
  - Removed observations that contains responses of 0 to a question which indicates a missing value
  - Removed observations that contains NONE, A1, A2 in country
  - Removed observations with age < 18 and => 130
  - Gender has three levels: male, female and other
  - A new column continents was created by grouping countries into five groups: Americas, Asia, Africa, Europe, Oceania
  - A new column age_grp was created by grouping age into four groups: teenager, young adult, adult, older adult
- Statistical Analysis includes three parts:
  1. Identify the underlying dimensions of scale through a parallel analysis and exploratory factor analysis (EFA)
  2. Explore types of adult romantic attachment styles by conducting a latent class analysis (LCA)
  3. Explore the relationship between romantic attachment styles and age, gender, geographical residence by conducting a multinomial logistic regression

# Parallel Analysis



Parallel Analysis Scree Plots

| dim | eigenval | percent |
|-----|----------|---------|
| 1 | 9.9813134 | 0.2772587 |
| 2 | 8.5722504 | 0.5153768 |
| 3 | 1.6391596 | 0.5609090 |
| 4 | 1.4295803 | 0.6006195 |
| 5 | 1.3136210 | 0.6371090 |
| 6 | 1.0422107 | 0.6660593 |
| 7 | 0.7733720 | 0.6875419 |
| 8 | 0.7245299 | 0.7076677 |
| 9 | 0.6418113 | 0.7254958 |
| 10 | 0.6339884 | 0.7431066 |

Look for elbow in the scree plot:  the number of dimensions is 2 [1].

51% of variability in the 36 items explained by first 2 dimensions.

# EFA

Goodness-of-fit statistics and model comparison

- Based on Chi-square and RMSEA, none of the three models is a good fit
- BIC is the largest for 1 factor model
- 2 and 3 factor model have smaller RMSEA
- Literature support for 2-factor model

| Fit statistics | 1 factor | 2 factor | 3 factor |
|---|---|---|---|
| BIC | 514975.1 | 189580.2 | 132632.5 |
| Chi-square | 521254 p-value < 2e-16 | 195489 p-value < 2e-16 | 138182 p-value < 2e-16 |
| RMSEA | 0.15 (0.15, 0.15) | 0.095 (0.094, 0.095) | 0.082 (0.082, 0.082) |

# EFA

- Factor loadings for 1 vs 2 vs 3 factor model
- For the 1 factor model, only half of the items have significantly loadings on the only one factor
- For the 3 factor model, items that load on factor 3 also loads on factor 1
- According to Dinero(2008), there are two dimensions: **Anxiety and Avoidance**
- Cronbach alpha
  - Anxiety: 0.88
  - avoidance : 0.95

| | WLS1 |
|---|---|
| q1 | 0.68 |
| q2 | |
| q3 | 0.74 |
| q4 | |
| q5 | 0.72 |
| q6 | |
| q7 | 0.76 |
| q8 | |
| q9 | 0.8 |
| q10 | |
| q11 | 0.68 |
| q12 | |
| q13 | 0.76 |
| q14 | |
| q15 | 0.68 |
| q16 | |
| q17 | 0.78 |
| q18 | |
| q19 | -0.7 |
| q20 | |
| q21 | 0.63 |
| q22 | |
| q23 | 0.78 |
| q24 | |
| q25 | 0.72 |
| q26 | |
| q27 | 0.73 |
| q28 | |
| q29 | 0.63 |
| q30 | |
| q31 | 0.71 |
| q32 | |
| q33 | 0.69 |
| q34 | |
| q35 | 0.68 |
| q36 | |

| | WLS1 | WLS2 |
|---|---|---|
| q1 | 0.68 | |
| q2 | | 0.75 |
| q3 | 0.74 | |
| q4 | | 0.71 |
| q5 | 0.73 | |
| q6 | | 0.73 |
| q7 | 0.77 | |
| q8 | | 0.75 |
| q9 | 0.8 | |
| q10 | | 0.7 |
| q11 | 0.71 | |
| q12 | | 0.61 |
| q13 | 0.77 | |
| q14 | | 0.69 |
| q15 | 0.68 | |
| q16 | | -0.61 |
| q17 | 0.79 | |
| q18 | | 0.75 |
| q19 | -0.7 | |
| q20 | | 0.64 |
| q21 | 0.63 | |
| q22 | | 0.67 |
| q23 | 0.77 | |
| q24 | | 0.65 |
| q25 | 0.71 | |
| q26 | | 0.61 |
| q27 | 0.73 | |
| q28 | | 0.55 |
| q29 | 0.63 | |
| q30 | | 0.64 |
| q31 | 0.71 | |
| q32 | | 0.58 |
| q33 | 0.68 | |
| q34 | | 0.57 |
| q35 | 0.67 | |
| q36 | | 0.6 |

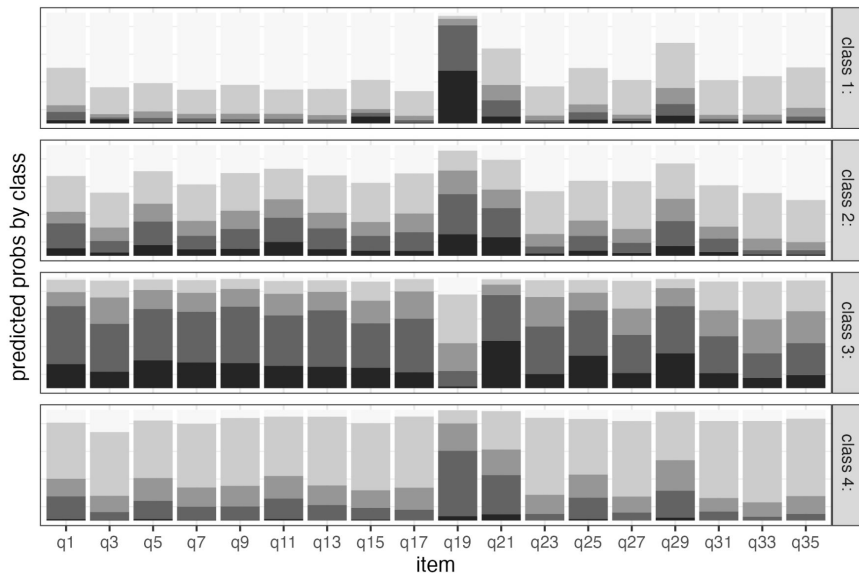| | WLS1 | WLS2 | WLS3 |
|---|---|---|---|
| q1 | | 0.44 | |
| q2 | 0.72 | | |
| q3 | | 0.61 | |
| q4 | 0.7 | | |
| q5 | | 0.81 | |
| q6 | 0.74 | | |
| q7 | | 0.85 | |
| q8 | 0.74 | | |
| q9 | | 0.59 | |
| q10 | 0.75 | | |
| q11 | | 0.71 | |
| q12 | 0.66 | | |
| q13 | | 0.83 | |
| q14 | 0.66 | | |
| q15 | | | 0.49 |
| q16 | -0.65 | | |
| q17 | | 0.68 | |
| q18 | 0.73 | | |
| q19 | | -0.42 | |
| q20 | 0.66 | | |
| q21 | | 0.48 | |
| q22 | 0.66 | | |
| q23 | | 0.67 | |
| q24 | 0.64 | | |
| q25 | | | 0.62 |
| q26 | 0.68 | | |
| q27 | | | 0.74 |
| q28 | 0.53 | | |
| q29 | | | |
| q30 | 0.61 | | |
| q31 | | | 0.67 |
| q32 | 0.53 | | |
| q33 | | | 0.73 |
| q34 | 0.52 | | |
| q35 | | | 0.75 |
| q36 | 0.59 | | |

# 2, 3, 4-Class LCA

We tried fitting 2-class, 3-class, and 4-class latent class models.

- The 4-class model has the lowest BIC
- According to the author of the scale, the scale aims to classify people into 4 groups
- Therefore, we choose to focus on the 4-class latent class model

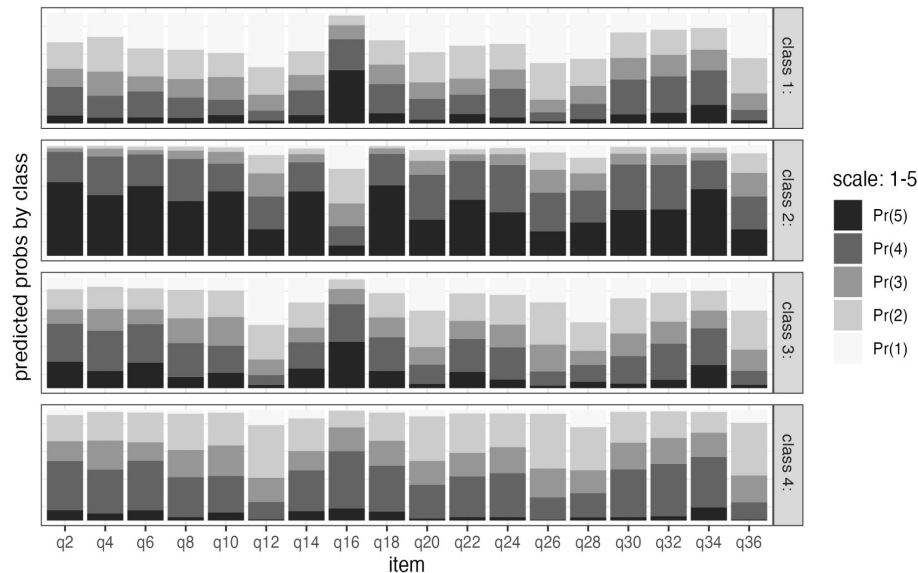| Fit statistics | 2-class | 3-class | 4-class |
|---|---|---|---|
| BIC | 3950094 | 3825552 | 3707773 |
| Chi-square | p-value < 2e-16 | p-value < 2e-16 | p-value < 2e-16 |

# Latent Class Analysis



Response Patterns by Class: Avoidance Items

Response Patterns by Class: Anxiety Items

Rank: class 3>class 4>class 2>class 1
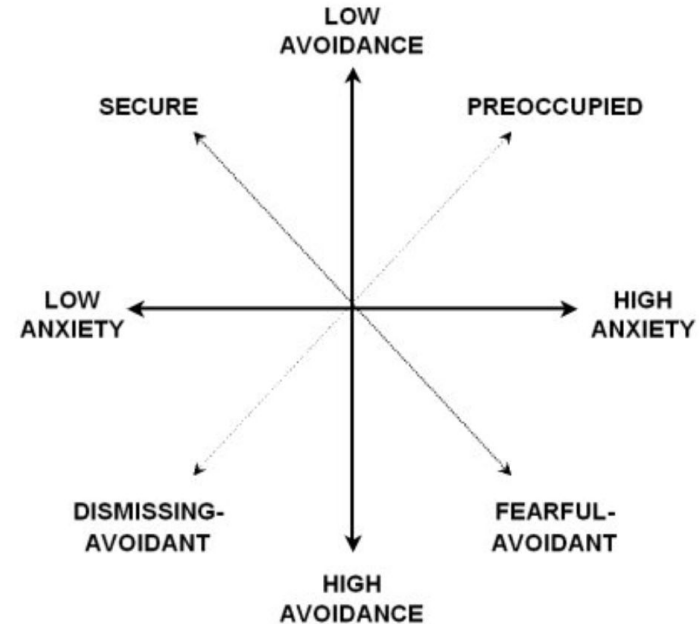
Rank: class 2>class 4>class 3>class 1

# Latent Class Analysis

Class 1 (19.32%): low avoidance, low anxiety — secure

Class 2 (21.39%): low avoidance, high anxiety — preoccupied

Class 3 (24.84%): high avoidance, low anxiety — dismissing avoidant

Class 4 (34.45%):  high avoidance, high anxiety — fearful avoidant

# Relating Romantic attachment type with gender, age, geographical residence

| OR<br>Covariates | Preoccupied vs. Secure (ref) | Dismissing avoidant vs. Secure (ref) | Fearful avoidant vs. Secure (ref) |
|---|---|---|---|
| Intercept | 2.058 | 2.311 | 2.058 |
| Continent: Africa | **1.359** | 1.218 | 1.145 |
| Continent: Asia | **1.206** | **0.791** | 1.099 |
| Continent: Europe | 0.945 | 1.051 | 0.986 |
| Continent: Oceania | 0.9 | 1.027 | 1.079 |
| Gender: Male | **0.85** | **0.821** | 0.97 |
| Gender: Other | **1.509** | **1.77** | 1.018 |
| Age: Young adult (20-35) | **0.595** | **0.606** | **0.841** |
| Age: Adult (36-50) | **0.364** | **0.432** | **0.877** |
| Age: Older adult (50+) | **0.208** | **0.347** | **0.841** |

Reference levels: Americas, Female, teenagers
**Bolded** means p < 0.05

# Discussion

- Two main factors identified: anxiety and avoidance
- Four latent classes of attachment styles, consistent with psychology theory: fearful avoidant, preoccupied, secure, and dismissing avoidant
- Age, gender, and geographical residence significantly associated with romantic attachment styles

# Conclusion

- Study successfully identified dimensions of the Experiences in Close Relationships scale
- Findings contribute to attachment theory literature and inform clinical practice and relationship education
- Understanding factors influencing attachment styles can aid in developing targeted interventions for healthier relationships
- Future research directions:
  - Explore interplay between demographic factors and attachment styles
  - Examine influence of other factors (socioeconomic status, childhood experiences, relationship history)
  - Longitudinal studies to investigate stability and changes in attachment styles over time

# Reference

[1] Collins L M, Horn J L. Best methods for the analysis of change: Recent advances, unanswered questions, future directions[M]. American Psychological Association, 1991.

[2] Dinero R E, Conger R D, Shaver P R, et al. Influence of family of origin and adult romantic partners on romantic attachment security[J]. Journal of family Psychology, 2008, 22(4): 622.

[3] Bartholomew K, Horowitz L M. Attachment styles among young adults: a test of a four-category model[J]. Journal of personality and social psychology, 1991, 61(2): 226.

[4] Brennan K A, Clark C L, Shaver P R. Self-report measurement of adult attachment: An integrative overview[J]. 1998.