

Self-Directed Learning of Secondary Students

Presentation to

Principals' Conference 2006

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Purpose of Today

Present results on relationship between
academic achievement and
self-directed learning for
HK secondary students

What Is Self-Directed Learning?

- Learner assumes major responsibility in the learning pursuit
- Different names are used
- A basic human competence – the ability to learn on one's own (Knowles, 1975)

Background: Education in the 21 Century

Four Pillars of Learning

- Learning to live together
- Learning to learn
- Learning to be
- Learning to do

Delors Report (1998)

Self-learning Is Central to Education

- Hong Kong: “to enable everyone to develop their full and individual potential in all areas... so that each individual is ready for continuous self-learning...”
- The G8 Governments and members of EC declared their commitment to lifelong learning at the 2000 Meeting
- Japan: “To enhance children's ability to think and learn for themselves”
- Korea: “to raise a self-reliant individual equipped with a distinct sense of independence, a creative individual with a sense of originality”
- Singapore: “be innovative - have a spirit of continual improvement, a lifelong habit of learning and an enterprising spirit in undertakings”
- Thailand: “To develop student's learning capabilities in the areas of: self-learning, creative thinking and basic academic learning”

What are the characteristics of a self-directed learner?



Characteristics of Self-directed Learner

1. Adaptive attributional beliefs; sense of responsibility for ones' own learning;
2. Strong academic self-confidence;
3. Believe that effort will bring about success;
4. Will set effective learning goals;
5. Visionary; farsighted;
6. Has good learning strategies; can self-monitor and self-regulate;
7. Capacity for time-management and resource management

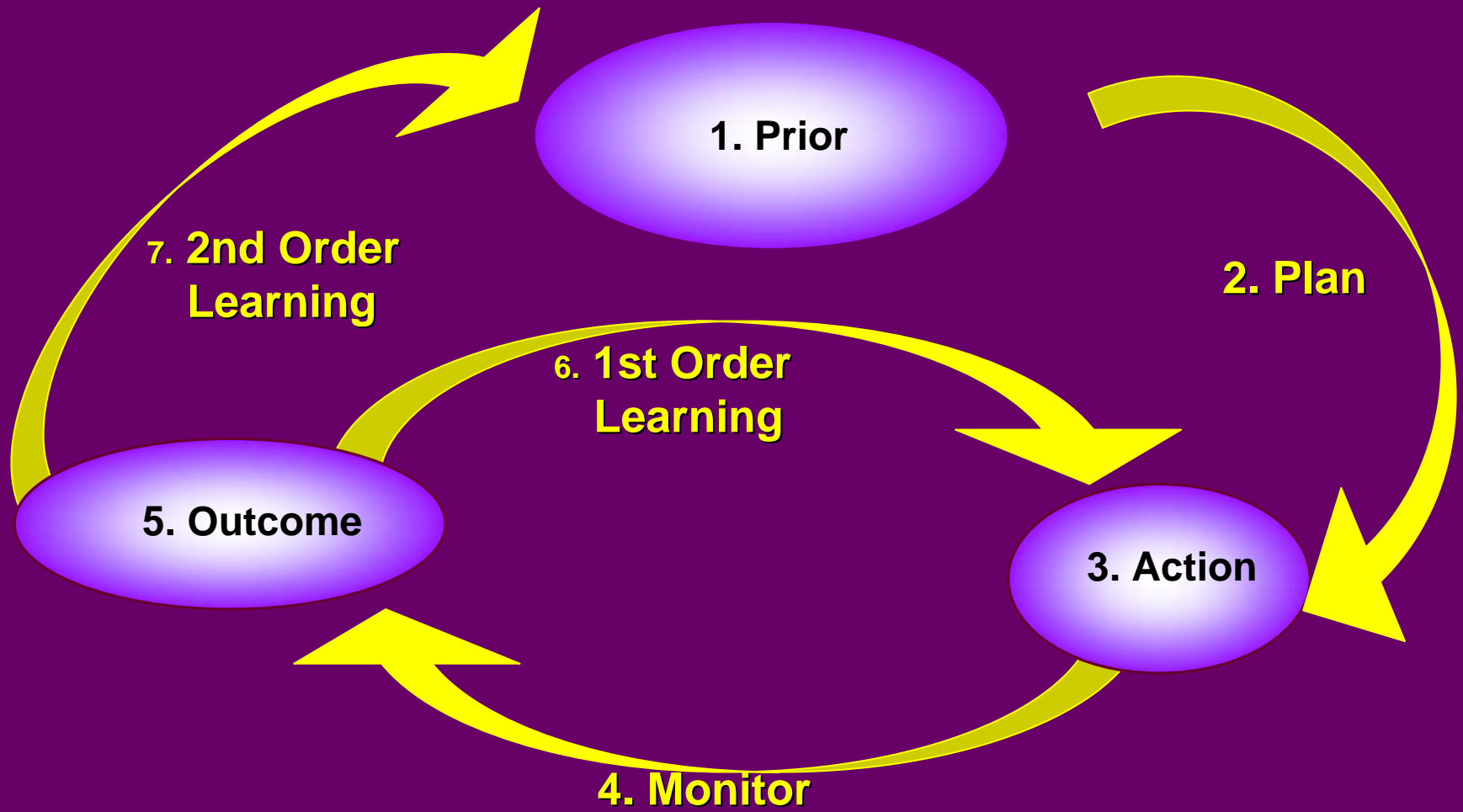
(Aldeman, 1999)

Characteristics of Self-directed Learner

1. Positive reactions toward feedback from others;
2. Respect individual differences and acknowledge one's own strengths and limitations; self-monitor and self-regulate accordingly;
3. Self-evaluate learning outcomes against set goals and make changes where necessary;
4. Manage external learning environment and make adjustments according to one's own conditions to maximize learning effectiveness.

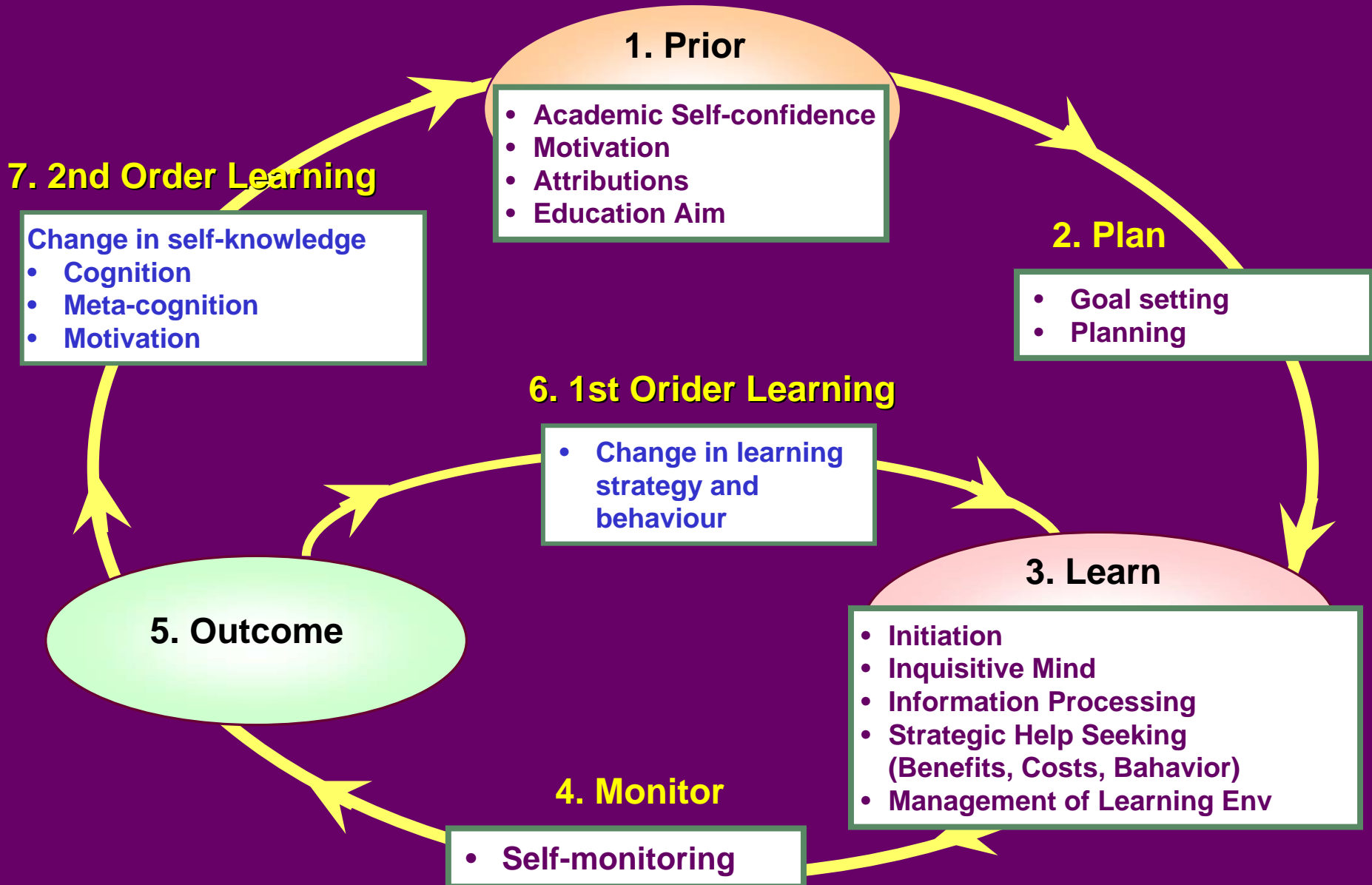
(Pintrich, 2000)

Double-looped Learning



(Mok & Cheng, 2001)

Self-Directed Learning Domains & Variables



The Research

Funded by Research Grants Committee, UGC 2003 - 2006

Research Team:

The Hong Kong Institute of Education

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- **Shen Meng Hsiang, *Research Assistant, EPCL Department***

The Sample

| | Count |
|--------------------|--------|
| Number of Students | 14,846 |
| Number of Schools | 23 |
| Number of Males | 7,238 |
| Number of Females | 7,521 |

The Self-directed Learning Scales (Will + Skill)

- Value of School Work (5 items)
- Academic Affect (5 items)
- Change for Improvement (5 items)
- Inquisitive Mind (5 items)
- Academic Self Concept (5 items)
- Education Aims (5 items)
- Goal Setting (5 items)
- Academic Monitoring (10 items)
- Frequency of Help-seeking Behaviour (5 items)
- Academic Initiation (5 items)
- Study Plan (5 items)
- Information Processing (10 items)

The Self-directed Learning Scales (Cont.)

- Management of Learning Environment (5 items)
- Help-seeking (10 items)
 - *Benefits of Help-seeking (5 items)*
 - *Costs of Help-seeking (5 items)*
- Failure Attribution (12 items)
 - *Failure Attribution to Ability (4 items)*
 - *Failure Attribution to Effort (4 items)*
 - *Failure Attribution to Strategy (4 items)*
- Success Attribution (12 items)
 - *Success Attribution to Ability (4 items)*
 - *Success Attribution to Effort (4 items)*
 - *Success Attribution to Strategy (4 items)*

| Factors | | 1.00 | 2.00 | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 |
|---------|------------------------|------------------------------|--------------------|-----------------------------|----------|----------------------------|-----------------------|--------------------------------------|-------------------------|------------------|-----------------------------|-----------------------|-------------------|--------------|----------|---------------|------------|-------|
| Item | Information Processing | Strategy Failure Attribution | Help-seeking Costs | Ability Success Attribution | Motivatr | Effort Failure Attribution | Help-seeking Benefits | Strategy/ Effort Success Attribution | Mgt of Learning Environ | Inquisitive Mind | Ability Failure Attribution | Help Seeking Behavior | Acad Self- Confid | Goal Setting | Planning | Education Aim | Initiation | |
| A01 | -0.01 | -0.03 | -0.02 | 0.02 | 0.61 | 0.02 | -0.03 | -0.03 | 0.03 | 0.00 | -0.01 | 0.02 | -0.01 | 0.05 | -0.05 | -0.05 | 0.03 | |
| A02 | 0.01 | 0.03 | 0.00 | 0.03 | 0.46 | 0.01 | 0.02 | -0.02 | 0.02 | 0.05 | -0.06 | 0.06 | 0.01 | 0.09 | -0.11 | -0.21 | 0.07 | |
| A03 | -0.01 | 0.04 | -0.01 | -0.01 | 0.41 | 0.03 | -0.01 | -0.07 | 0.04 | 0.09 | -0.08 | 0.07 | 0.04 | 0.08 | -0.16 | -0.11 | 0.11 | |
| A04 | 0.13 | 0.02 | -0.03 | 0.00 | 0.46 | 0.03 | -0.02 | 0.01 | 0.02 | 0.05 | -0.02 | 0.00 | 0.06 | -0.02 | 0.04 | 0.01 | 0.01 | |
| A05 | 0.07 | 0.00 | -0.02 | 0.02 | 0.58 | 0.00 | -0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | -0.08 | 0.01 | 0.01 | -0.07 | |
| A06 | -0.03 | 0.02 | 0.04 | -0.01 | 0.27 | -0.02 | -0.01 | -0.05 | 0.04 | 0.05 | 0.02 | 0.02 | 0.06 | 0.04 | -0.05 | -0.19 | 0.04 | |
| A07 | -0.02 | 0.06 | -0.01 | -0.06 | 0.22 | -0.07 | -0.02 | -0.06 | 0.05 | 0.03 | -0.02 | 0.08 | 0.25 | -0.02 | -0.13 | -0.03 | 0.08 | |
| A08 | -0.07 | 0.07 | 0.02 | -0.03 | 0.18 | -0.02 | -0.04 | -0.10 | 0.04 | 0.16 | 0.01 | 0.10 | 0.19 | 0.02 | -0.12 | -0.09 | 0.09 | |
| A09 | -0.04 | 0.04 | -0.01 | -0.06 | 0.23 | -0.04 | -0.04 | -0.09 | 0.03 | 0.10 | 0.03 | 0.06 | 0.15 | 0.06 | -0.09 | -0.19 | 0.08 | |
| A10 | 0.01 | 0.01 | -0.01 | 0.00 | 0.39 | -0.02 | -0.06 | 0.02 | -0.01 | -0.01 | -0.01 | 0.00 | 0.11 | -0.08 | 0.00 | -0.18 | -0.11 | |
| B01 | 0.13 | 0.00 | 0.00 | 0.02 | 0.35 | 0.00 | -0.03 | -0.03 | -0.02 | 0.21 | -0.01 | 0.02 | 0.03 | -0.06 | 0.02 | -0.09 | -0.03 | |
| B02 | 0.00 | 0.02 | -0.02 | 0.02 | 0.07 | -0.01 | -0.04 | 0.00 | 0.02 | 0.69 | -0.01 | -0.01 | -0.05 | 0.03 | -0.02 | -0.06 | 0.03 | |
| B03 | 0.06 | 0.02 | 0.02 | 0.04 | -0.01 | -0.01 | 0.00 | 0.03 | 0.00 | 0.71 | -0.03 | -0.04 | -0.01 | -0.06 | 0.03 | 0.05 | -0.05 | |
| B04 | 0.01 | 0.00 | -0.01 | 0.02 | -0.01 | 0.01 | -0.02 | -0.02 | 0.03 | 0.63 | 0.03 | 0.00 | -0.03 | -0.03 | 0.02 | 0.00 | -0.02 | |
| B05 | 0.01 | 0.00 | -0.03 | -0.07 | 0.05 | -0.03 | -0.07 | -0.07 | 0.01 | 0.23 | 0.04 | 0.06 | 0.15 | -0.01 | -0.08 | -0.10 | -0.06 | |
| B06 | 0.02 | 0.02 | 0.01 | 0.09 | -0.03 | -0.07 | -0.02 | -0.01 | 0.07 | -0.03 | 0.01 | 0.04 | 0.59 | 0.01 | 0.02 | -0.01 | -0.01 | |
| B07 | 0.01 | -0.01 | 0.03 | 0.08 | 0.06 | -0.01 | -0.01 | 0.00 | 0.03 | -0.01 | -0.01 | -0.07 | 0.60 | -0.12 | 0.03 | 0.04 | -0.08 | |
| B08 | 0.10 | 0.00 | 0.01 | 0.06 | 0.04 | 0.05 | -0.03 | 0.03 | -0.02 | 0.08 | -0.12 | -0.08 | 0.50 | -0.07 | 0.00 | 0.04 | -0.06 | |
| B09 | 0.11 | -0.04 | -0.03 | 0.04 | 0.06 | 0.04 | -0.04 | 0.00 | -0.05 | 0.03 | -0.06 | -0.04 | 0.52 | -0.02 | -0.03 | -0.06 | -0.02 | |
| B10 | 0.04 | 0.01 | -0.02 | 0.05 | 0.01 | -0.06 | -0.03 | 0.00 | 0.04 | -0.07 | 0.03 | 0.03 | 0.61 | -0.03 | 0.00 | -0.06 | 0.01 | |
| C01 | 0.04 | 0.00 | 0.01 | 0.04 | 0.06 | 0.00 | 0.02 | 0.04 | 0.04 | 0.00 | -0.01 | -0.04 | 0.00 | -0.10 | 0.05 | -0.54 | -0.11 | |
| C02 | 0.04 | 0.02 | 0.01 | 0.01 | -0.02 | -0.01 | -0.04 | -0.01 | 0.02 | 0.01 | -0.01 | -0.01 | -0.01 | 0.00 | -0.02 | -0.75 | -0.01 | |
| C03 | 0.06 | 0.01 | -0.01 | 0.02 | 0.02 | 0.02 | -0.06 | -0.01 | 0.00 | -0.01 | -0.01 | 0.01 | -0.02 | -0.01 | 0.00 | -0.68 | 0.00 | |
| C04 | 0.06 | 0.01 | 0.00 | 0.02 | 0.15 | -0.02 | -0.11 | 0.00 | -0.01 | 0.08 | 0.03 | 0.01 | 0.01 | -0.10 | 0.03 | -0.41 | 0.02 | |
| C05 | 0.04 | 0.04 | -0.03 | 0.00 | 0.09 | 0.00 | -0.10 | -0.04 | 0.01 | 0.30 | -0.01 | 0.03 | 0.01 | -0.04 | 0.00 | -0.26 | 0.10 | |
| C06 | -0.01 | 0.01 | 0.00 | 0.02 | -0.01 | 0.02 | -0.01 | -0.03 | 0.02 | 0.19 | -0.07 | 0.06 | 0.12 | -0.43 | -0.11 | -0.10 | 0.02 | |
| C07 | 0.02 | 0.01 | 0.02 | 0.00 | 0.08 | -0.04 | -0.03 | 0.00 | 0.09 | -0.03 | 0.00 | 0.06 | 0.08 | -0.48 | -0.01 | -0.06 | -0.09 | |
| C08 | 0.07 | -0.03 | -0.01 | -0.02 | -0.04 | 0.01 | -0.03 | -0.08 | 0.04 | 0.11 | 0.03 | 0.07 | 0.08 | -0.41 | -0.07 | -0.10 | 0.13 | |
| C09 | 0.05 | 0.01 | -0.01 | -0.02 | -0.01 | 0.00 | -0.02 | -0.05 | 0.02 | 0.08 | -0.01 | 0.08 | 0.09 | -0.52 | -0.11 | -0.14 | 0.11 | |
| C10 | 0.02 | 0.00 | 0.02 | 0.01 | -0.02 | 0.00 | 0.00 | -0.03 | 0.05 | 0.01 | -0.02 | 0.06 | 0.09 | -0.45 | -0.26 | -0.05 | 0.03 | |
| E01 | 0.02 | 0.08 | 0.06 | 0.01 | 0.03 | -0.02 | -0.05 | -0.02 | 0.08 | -0.06 | 0.02 | 0.41 | -0.08 | -0.13 | -0.03 | 0.00 | -0.01 | |
| E02 | -0.02 | 0.00 | 0.02 | 0.01 | -0.04 | 0.03 | 0.03 | -0.02 | 0.04 | 0.01 | -0.02 | 0.45 | 0.04 | 0.02 | 0.01 | -0.03 | -0.22 | |
| E03 | 0.03 | 0.00 | -0.04 | -0.01 | 0.01 | 0.01 | -0.06 | -0.01 | 0.01 | 0.02 | -0.01 | 0.67 | 0.02 | 0.04 | -0.01 | -0.02 | 0.00 | |
| E04 | 0.06 | 0.03 | -0.02 | 0.02 | 0.04 | -0.01 | -0.12 | 0.01 | -0.03 | 0.00 | 0.00 | 0.66 | -0.02 | -0.04 | 0.01 | 0.05 | 0.06 | |
| E05 | 0.08 | 0.02 | 0.00 | 0.04 | 0.06 | -0.04 | -0.11 | 0.01 | 0.02 | -0.01 | 0.03 | 0.51 | -0.06 | -0.09 | 0.01 | 0.02 | 0.03 | |
| F01 | 0.15 | -0.02 | 0.00 | 0.04 | -0.05 | 0.01 | 0.01 | -0.02 | 0.01 | 0.20 | -0.05 | 0.17 | 0.09 | 0.09 | -0.07 | -0.03 | -0.35 | |
| F02 | 0.14 | 0.00 | -0.02 | 0.01 | -0.05 | 0.02 | -0.06 | -0.01 | 0.00 | 0.25 | -0.06 | 0.18 | 0.10 | 0.07 | -0.08 | -0.05 | -0.25 | |
| F03 | 0.12 | 0.02 | 0.03 | 0.01 | -0.01 | -0.04 | -0.02 | 0.01 | 0.02 | 0.15 | -0.02 | 0.05 | 0.08 | -0.06 | -0.13 | -0.03 | -0.32 | |
| F04 | 0.00 | -0.04 | -0.03 | 0.01 | 0.03 | -0.02 | -0.04 | -0.04 | 0.05 | 0.04 | 0.01 | 0.10 | 0.09 | 0.00 | -0.06 | -0.07 | -0.53 | |
| F05 | 0.06 | -0.02 | -0.03 | -0.01 | -0.03 | -0.01 | -0.06 | -0.05 | 0.03 | 0.06 | 0.02 | 0.12 | 0.11 | 0.02 | -0.10 | -0.11 | -0.40 | |

- EFA factor loadings; Please refer to Handout for EFA details;
- 17 clearly identified factors, conforming to construction; 47% total var extracted

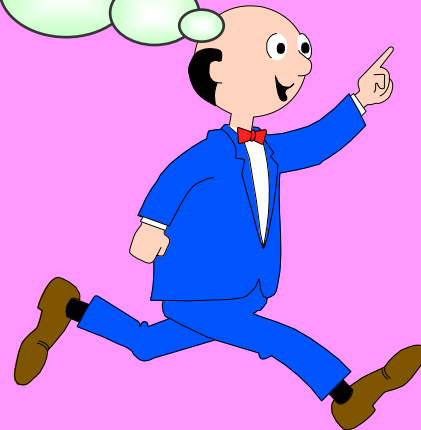
| Factors | | 1.00 | 2.00 | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 |
|---------|------------------------|------------------------------|--------------------|-----------------------------|----------|----------------------------|-----------------------|--------------------------------------|-------------------------|------------------|-----------------------------|-----------------------|------------------|--------------|----------|---------------|------------|-------|
| Item | Information Processing | Strategy Failure Attribution | Help-seeking Costs | Ability Success Attribution | Motivatr | Effort Failure Attribution | Help-seeking Benefits | Strategy/ Effort Success Attribution | Mgt of Learning Environ | Inquisitive Mind | Ability Failure Attribution | Help Seeking Behavior | Acad Self-Confid | Goal Setting | Planning | Education Aim | Initiation | |
| F06 | 0.08 | 0.03 | 0.04 | 0.02 | 0.01 | -0.02 | 0.03 | -0.01 | 0.07 | -0.04 | -0.03 | 0.02 | 0.02 | -0.27 | -0.36 | -0.03 | -0.12 | |
| F07 | 0.11 | 0.06 | 0.02 | 0.04 | 0.02 | -0.03 | -0.02 | 0.02 | 0.03 | -0.01 | -0.02 | 0.02 | 0.01 | -0.13 | -0.52 | 0.00 | -0.06 | |
| F08 | 0.02 | 0.01 | -0.03 | 0.02 | 0.03 | -0.02 | -0.07 | -0.04 | 0.03 | 0.00 | 0.00 | 0.01 | -0.02 | 0.00 | -0.68 | 0.01 | 0.00 | |
| F09 | 0.07 | 0.01 | 0.00 | 0.04 | 0.01 | -0.01 | -0.08 | -0.01 | 0.04 | 0.00 | 0.01 | -0.02 | -0.01 | 0.00 | -0.67 | 0.01 | 0.01 | |
| F10 | 0.11 | 0.03 | 0.02 | 0.05 | 0.04 | -0.04 | -0.04 | 0.01 | 0.04 | -0.01 | 0.02 | -0.03 | -0.05 | -0.08 | -0.50 | 0.00 | -0.10 | |
| G01 | 0.45 | 0.00 | 0.02 | 0.01 | -0.02 | -0.01 | -0.01 | -0.01 | 0.01 | 0.01 | -0.02 | 0.06 | 0.01 | -0.01 | -0.12 | -0.04 | -0.06 | |
| G02 | 0.53 | 0.00 | 0.02 | 0.01 | -0.01 | 0.00 | -0.04 | 0.01 | 0.02 | 0.04 | -0.02 | 0.03 | 0.04 | -0.01 | -0.05 | -0.02 | -0.01 | |
| G03 | 0.57 | 0.02 | 0.02 | 0.01 | -0.01 | -0.01 | 0.02 | -0.01 | 0.02 | 0.00 | 0.00 | 0.05 | 0.00 | -0.01 | -0.01 | -0.04 | 0.02 | |
| G04 | 0.60 | 0.00 | 0.01 | 0.00 | -0.05 | 0.01 | -0.02 | -0.03 | 0.00 | 0.00 | -0.02 | 0.03 | 0.04 | 0.04 | -0.07 | -0.07 | 0.05 | |
| G05 | 0.54 | 0.00 | 0.00 | -0.02 | -0.02 | 0.02 | -0.03 | -0.06 | 0.02 | -0.03 | 0.02 | 0.03 | 0.01 | 0.04 | -0.06 | -0.06 | 0.04 | |
| G06 | 0.47 | -0.01 | 0.00 | 0.01 | 0.02 | -0.02 | -0.01 | -0.02 | 0.05 | -0.05 | 0.04 | 0.01 | 0.03 | -0.04 | -0.04 | -0.03 | -0.04 | |
| G07 | 0.50 | -0.02 | 0.04 | 0.05 | 0.15 | -0.02 | -0.01 | 0.04 | 0.03 | 0.05 | 0.01 | -0.04 | 0.02 | -0.08 | 0.06 | 0.04 | -0.10 | |
| G08 | 0.65 | 0.00 | -0.02 | 0.00 | 0.05 | 0.02 | -0.01 | 0.00 | 0.01 | 0.06 | 0.01 | 0.01 | -0.01 | -0.01 | 0.04 | 0.01 | 0.00 | |
| G09 | 0.62 | 0.00 | -0.01 | 0.00 | 0.04 | 0.01 | -0.05 | 0.01 | -0.02 | 0.07 | -0.01 | 0.00 | 0.02 | 0.01 | 0.01 | 0.00 | 0.01 | |
| G10 | 0.47 | -0.01 | 0.00 | -0.03 | -0.01 | 0.03 | -0.06 | -0.06 | 0.03 | 0.01 | 0.01 | 0.00 | 0.05 | 0.01 | -0.07 | -0.02 | 0.05 | |
| H01 | 0.01 | 0.01 | 0.08 | 0.01 | 0.14 | -0.08 | -0.05 | 0.05 | 0.37 | -0.03 | 0.04 | -0.05 | 0.01 | -0.13 | 0.02 | -0.03 | -0.21 | |
| H02 | 0.04 | 0.01 | -0.05 | -0.01 | -0.06 | 0.03 | 0.00 | -0.04 | 0.81 | 0.03 | 0.00 | 0.03 | 0.01 | 0.05 | -0.03 | -0.02 | 0.12 | |
| H03 | 0.01 | -0.02 | 0.04 | 0.04 | 0.06 | 0.00 | -0.03 | 0.03 | 0.59 | 0.01 | 0.02 | 0.01 | 0.00 | -0.06 | 0.04 | 0.00 | -0.14 | |
| H04 | 0.02 | 0.02 | -0.04 | -0.02 | -0.06 | 0.02 | 0.00 | -0.05 | 0.79 | 0.03 | -0.01 | 0.05 | 0.02 | 0.08 | -0.04 | -0.01 | -0.13 | |
| H05 | 0.02 | 0.03 | 0.11 | 0.02 | 0.05 | -0.05 | -0.06 | 0.04 | 0.45 | -0.02 | -0.02 | -0.07 | 0.02 | -0.09 | -0.05 | 0.01 | -0.10 | |
| H06 | -0.02 | 0.01 | -0.02 | -0.03 | -0.04 | 0.02 | -0.79 | -0.01 | 0.01 | 0.01 | -0.01 | 0.05 | 0.02 | 0.06 | -0.04 | 0.00 | 0.04 | |
| H07 | -0.04 | 0.01 | 0.00 | 0.00 | -0.03 | 0.00 | -0.90 | 0.02 | -0.03 | 0.00 | 0.00 | -0.01 | 0.00 | 0.01 | 0.00 | -0.01 | -0.01 | |
| H08 | 0.05 | 0.00 | -0.01 | -0.01 | -0.03 | 0.01 | -0.76 | -0.03 | -0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.03 | -0.01 | -0.02 | 0.02 | |
| H09 | 0.06 | 0.01 | 0.05 | 0.05 | 0.09 | -0.03 | -0.37 | 0.03 | 0.08 | 0.06 | -0.01 | 0.02 | -0.04 | -0.11 | 0.02 | -0.03 | -0.14 | |
| H10 | 0.04 | -0.01 | 0.02 | 0.03 | 0.05 | 0.02 | -0.48 | -0.06 | 0.07 | -0.01 | 0.00 | 0.07 | 0.02 | -0.02 | -0.02 | 0.01 | -0.02 | |
| H11 | -0.02 | -0.02 | 0.75 | 0.01 | 0.00 | -0.01 | 0.01 | -0.04 | 0.02 | 0.03 | 0.02 | 0.01 | -0.02 | 0.01 | -0.01 | 0.02 | 0.03 | |
| H12 | 0.00 | -0.02 | 0.76 | 0.02 | 0.02 | 0.01 | 0.00 | -0.01 | 0.01 | -0.01 | 0.00 | -0.01 | -0.03 | 0.00 | 0.00 | 0.00 | -0.01 | |
| H13 | 0.00 | 0.00 | 0.77 | 0.03 | 0.00 | -0.02 | -0.01 | 0.04 | -0.01 | -0.03 | 0.00 | -0.01 | 0.02 | -0.03 | 0.01 | 0.02 | -0.06 | |
| H14 | -0.01 | -0.01 | 0.83 | 0.03 | 0.01 | -0.04 | 0.04 | 0.02 | -0.02 | -0.04 | 0.00 | -0.03 | 0.03 | -0.03 | 0.02 | 0.00 | -0.04 | |
| H15 | 0.03 | 0.04 | 0.60 | -0.05 | -0.06 | 0.04 | -0.02 | -0.03 | -0.02 | 0.03 | 0.00 | 0.03 | 0.02 | 0.08 | -0.01 | -0.03 | 0.11 | |
| I1A | 0.01 | 0.63 | 0.02 | -0.04 | -0.01 | -0.01 | -0.03 | -0.03 | 0.02 | 0.03 | 0.01 | 0.04 | -0.01 | 0.02 | -0.02 | 0.01 | 0.04 | |
| I2C | 0.01 | 0.58 | 0.02 | -0.02 | 0.02 | 0.05 | 0.00 | 0.03 | 0.01 | 0.01 | 0.15 | 0.01 | 0.00 | -0.01 | 0.01 | -0.02 | -0.02 | |
| I3A | -0.02 | 0.75 | -0.02 | -0.05 | -0.01 | 0.10 | -0.01 | -0.02 | 0.02 | 0.01 | 0.03 | 0.00 | 0.02 | 0.01 | -0.02 | -0.01 | 0.01 | |
| I4B | -0.05 | 0.72 | 0.00 | -0.05 | 0.00 | 0.13 | -0.02 | 0.03 | 0.00 | -0.01 | 0.08 | 0.03 | 0.02 | 0.00 | -0.03 | -0.01 | 0.00 | |
| I1B | 0.02 | 0.01 | 0.01 | -0.01 | 0.00 | 0.68 | 0.00 | -0.04 | 0.00 | 0.03 | -0.01 | 0.02 | 0.01 | 0.02 | 0.05 | -0.02 | 0.01 | |
| I2A | 0.01 | 0.05 | 0.01 | 0.05 | 0.05 | 0.69 | -0.01 | 0.02 | 0.00 | 0.00 | -0.02 | 0.00 | -0.01 | 0.00 | 0.00 | 0.01 | -0.02 | |
| I3B | 0.00 | 0.04 | 0.00 | 0.04 | 0.01 | 0.64 | 0.00 | -0.03 | 0.01 | -0.03 | 0.04 | -0.02 | -0.05 | -0.05 | 0.01 | 0.01 | 0.00 | |
| I4A | 0.00 | 0.05 | -0.01 | 0.01 | -0.02 | 0.79 | -0.02 | -0.01 | 0.01 | -0.02 | -0.03 | 0.00 | 0.02 | -0.01 | -0.01 | -0.02 | -0.03 | |
| I1C | 0.03 | 0.00 | 0.00 | 0.03 | -0.02 | -0.08 | 0.00 | -0.05 | 0.01 | 0.03 | 0.63 | 0.02 | 0.01 | 0.03 | 0.00 | 0.03 | 0.01 | |
| I2B | 0.01 | 0.06 | 0.00 | 0.04 | -0.02 | 0.03 | 0.00 | -0.03 | -0.01 | 0.00 | 0.68 | 0.01 | 0.06 | 0.04 | 0.00 | -0.03 | 0.03 | |
| I3C | -0.01 | 0.12 | 0.09 | -0.09 | 0.05 | 0.06 | 0.01 | 0.04 | -0.01 | -0.03 | 0.43 | -0.03 | -0.17 | -0.09 | 0.01 | 0.01 | -0.07 | |
| I4C | 0.00 | 0.07 | 0.01 | 0.04 | -0.02 | 0.04 | 0.00 | 0.03 | 0.00 | -0.02 | 0.74 | -0.02 | -0.03 | -0.02 | 0.00 | 0.00 | -0.03 | |
| J1A | 0.08 | 0.26 | -0.03 | 0.14 | -0.01 | -0.06 | -0.03 | -0.53 | 0.00 | 0.01 | -0.07 | -0.02 | -0.02 | -0.02 | 0.05 | -0.01 | -0.03 | |
| J2A | 0.07 | 0.27 | -0.02 | 0.19 | 0.00 | -0.09 | -0.03 | -0.54 | 0.00 | -0.02 | -0.10 | -0.02 | -0.03 | -0.03 | 0.04 | -0.03 | -0.04 | |
| J3C | 0.07 | 0.23 | -0.01 | 0.19 | -0.01 | -0.08 | -0.02 | -0.58 | 0.02 | -0.04 | -0.11 | -0.02 | -0.02 | -0.03 | 0.01 | -0.02 | -0.04 | |
| J4C | 0.09 | 0.11 | -0.02 | 0.15 | 0.05 | -0.05 | -0.04 | -0.45 | 0.03 | -0.04 | -0.06 | 0.02 | -0.05 | -0.08 | -0.01 | -0.03 | -0.07 | |
| J1B | 0.05 | -0.02 | -0.02 | 0.06 | 0.02 | 0.05 | -0.05 | -0.54 | 0.00 | 0.08 | 0.07 | -0.01 | 0.02 | -0.01 | 0.02 | -0.02 | -0.01 | |
| J2C | -0.02 | -0.03 | 0.05 | -0.03 | 0.04 | 0.03 | 0.00 | -0.51 | 0.03 | 0.01 | 0.14 | 0.05 | -0.01 | -0.02 | -0.05 | 0.00 | -0.01 | |
| J3B | -0.03 | -0.12 | -0.02 | -0.08 | 0.02 | 0.10 | -0.05 | -0.72 | 0.04 | 0.02 | 0.03 | 0.03 | 0.05 | 0.03 | -0.07 | 0.00 | 0.03 | |
| J4A | 0.01 | -0.10 | -0.01 | -0.04 | 0.01 | 0.14 | -0.07 | -0.70 | 0.01 | 0.00 | 0.00 | 0.02 | 0.05 | 0.00 | -0.03 | -0.02 | 0.03 | |
| J1C | -0.02 | -0.04 | 0.00 | 0.78 | -0.02 | 0.00 | 0.01 | 0.04 | 0.01 | 0.01 | 0.09 | 0.03 | 0.10 | 0.03 | -0.03 | -0.03 | 0.07 | |
| J2B | 0.03 | -0.02 | -0.02 | 0.63 | -0.01 | 0.02 | 0.00 | -0.16 | 0.00 | 0.05 | 0.02 | 0.01 | 0.02 | 0.02 | 0.00 | 0.00 | -0.02 | |
| J3A | -0.05 | 0.00 | -0.01 | 0.83 | 0.00 | 0.01 | 0.00 | 0.02 | 0.02 | 0.01 | 0.01 | 0.04 | 0.06 | 0.05 | -0.06 | -0.02 | 0.06 | |
| J4B | 0.01 | -0.07 | 0.05 | 0.58 | 0.04 | 0.09 | -0.01 | -0.01 | -0.01 | 0.02 | -0.04 | -0.03 | -0.02 | -0.05 | 0.00 | -0.01 | -0.06 | |

Validity of Scales

- Confirmatory Factor Analysis supported the constructs
- GFI = 0.90
- CFI = 0.90
- NNFI = 0.90
- RMSEA = 0.035

**What are the relationships
between self-directed
learning and academic
achievement?**

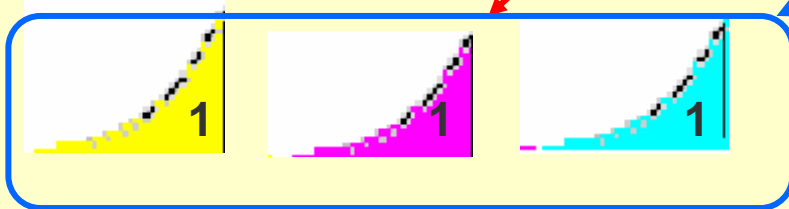
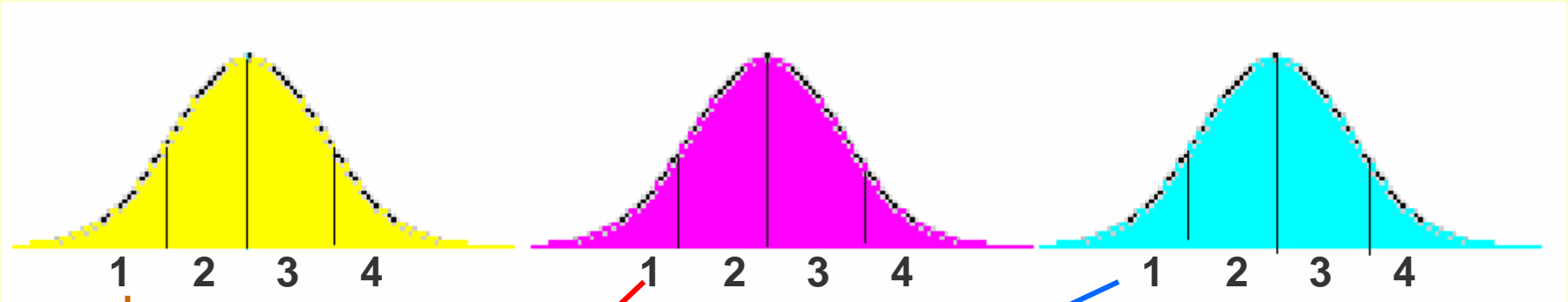
**Zimmerman (1989,
1990, 1996, 1997)**



Chinese

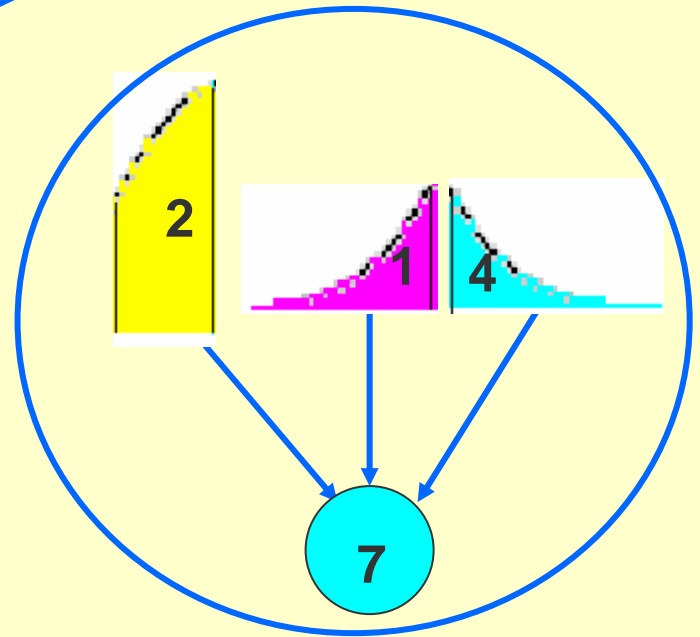
English

Math



The lowest achieving group

3

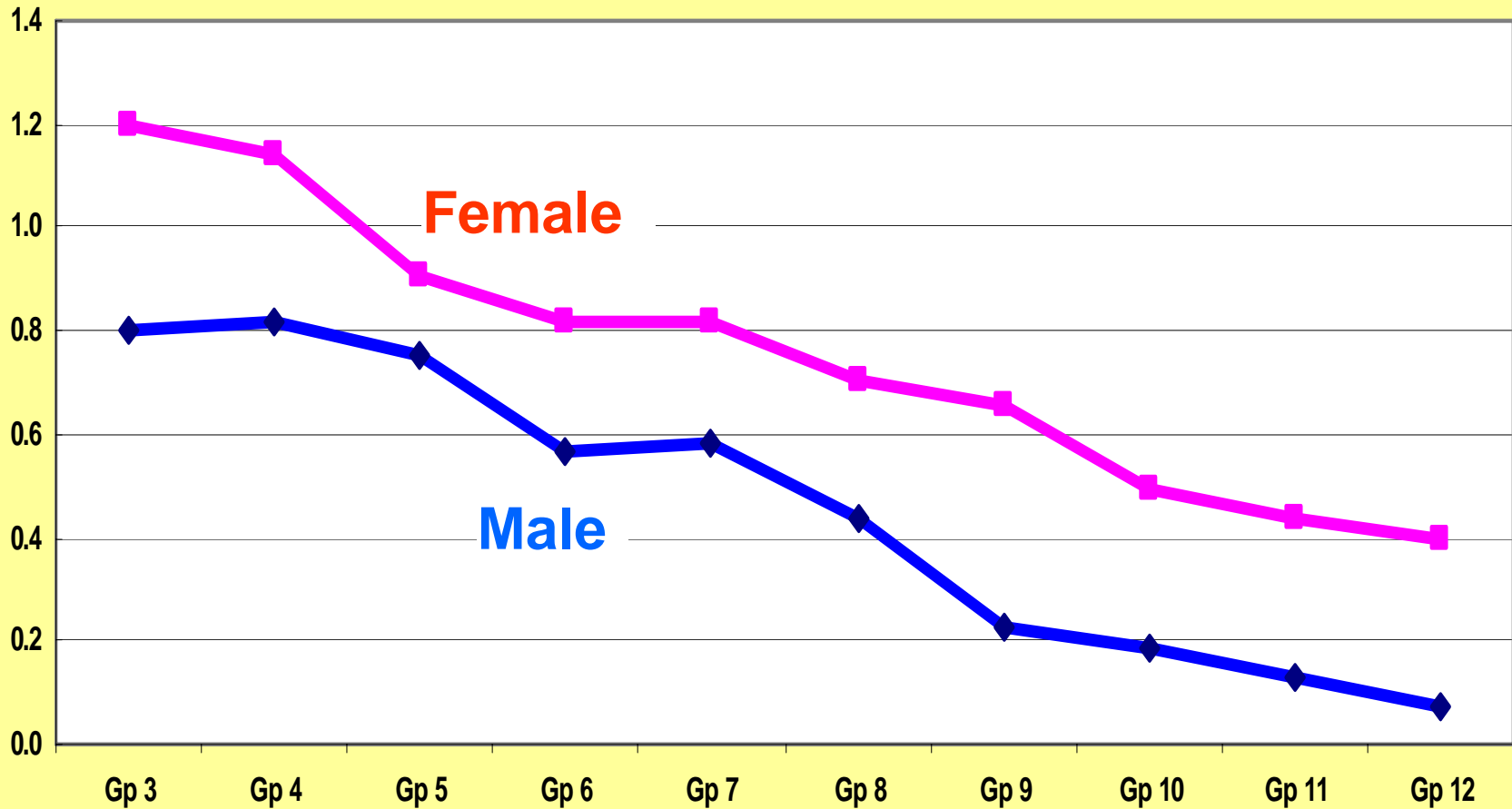


10 groups: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

Our Findings

- **Strong association between academic achievement and self-directed learning**
 - **Attribution**
 - **Help-seeking**
 - **Motivation**
 - **Self-concept**
 - **Self-regulation**
 - **Information processing**
 - ...

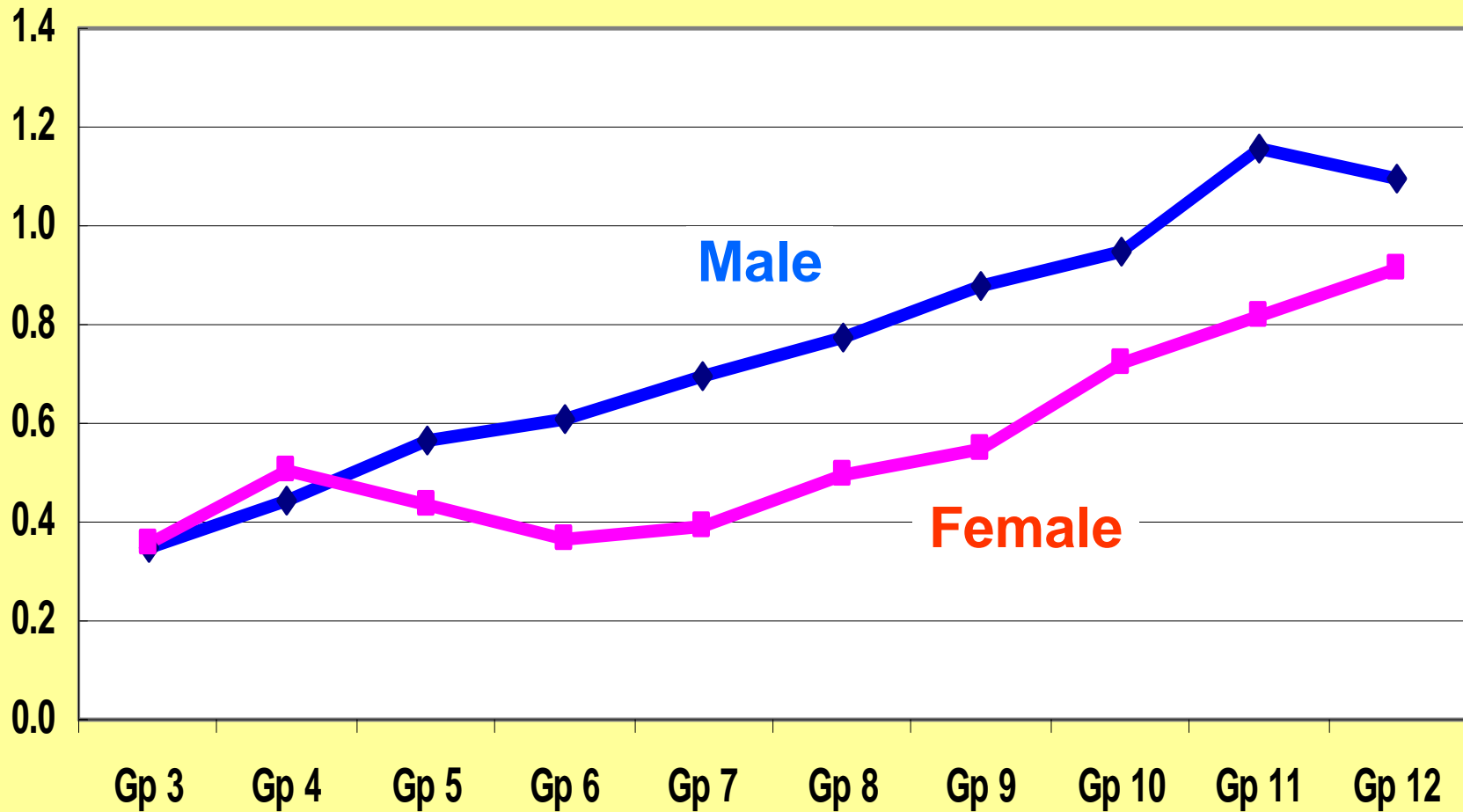
Compare Male & Female Ability Failure Attribution Across Achievement Groups



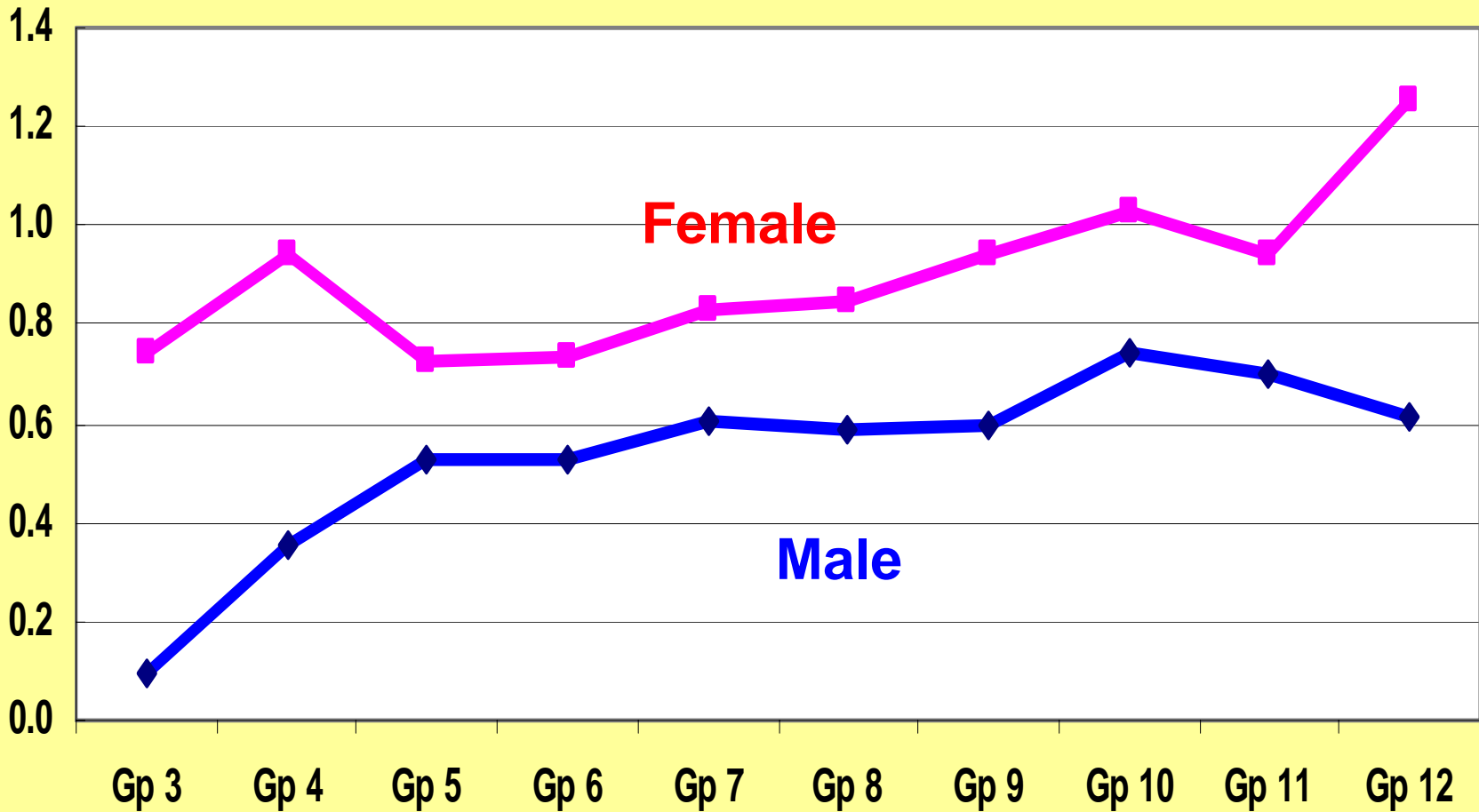
Weakest

Strongest

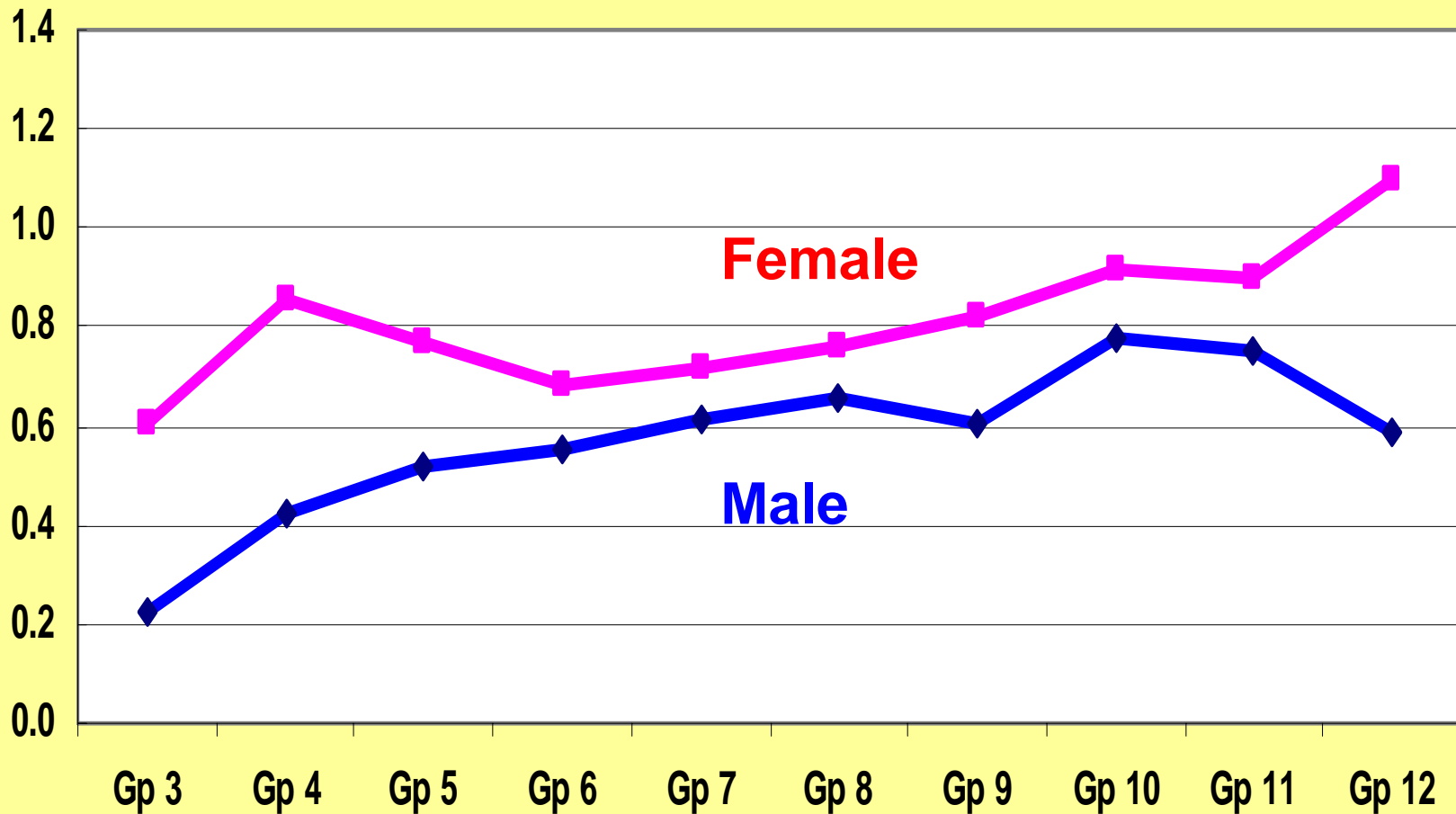
Compare Male & Female Ability Success Attribution Across Ach Groups



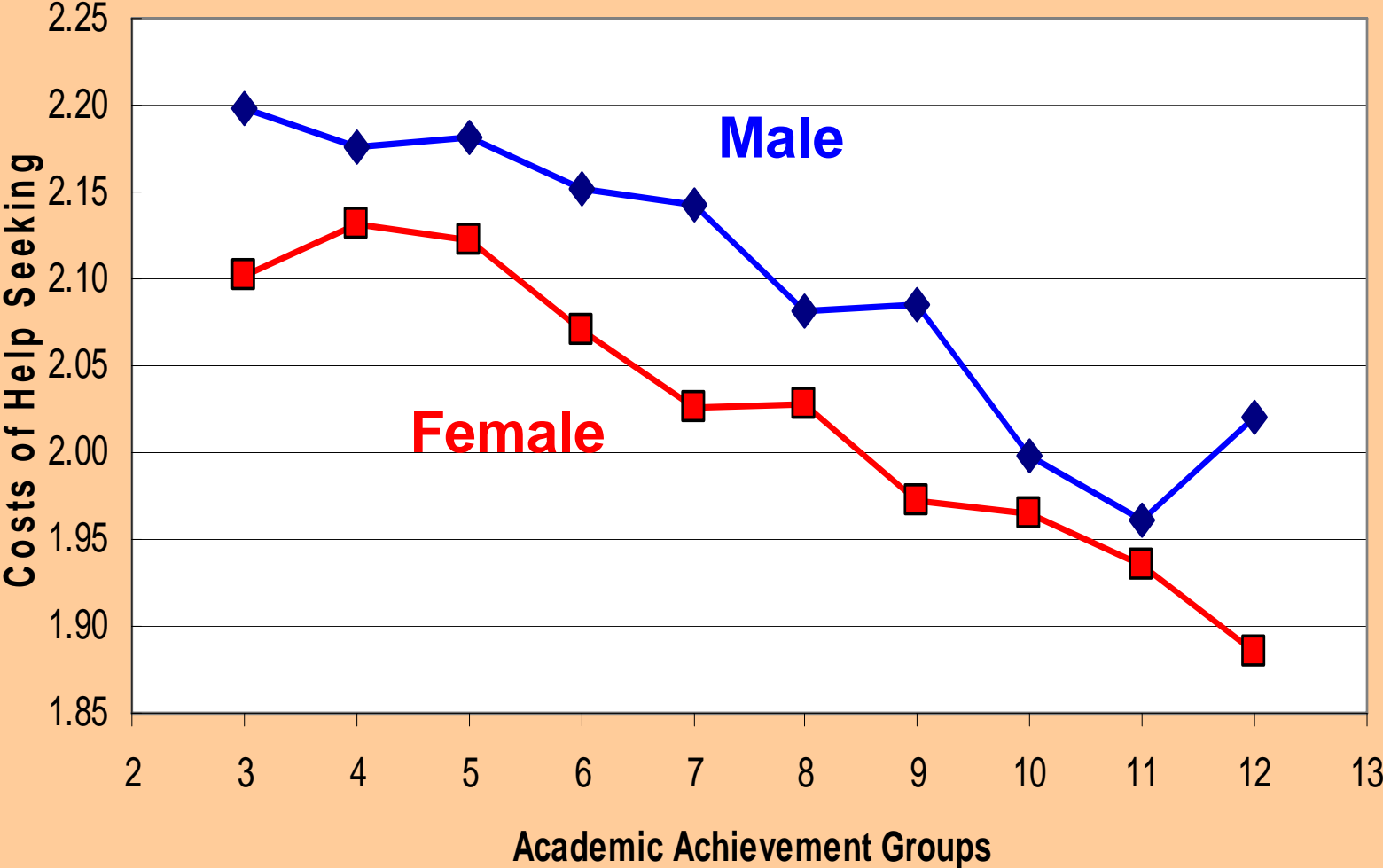
Compare Male & Female Effort Success Attributions Across Achievement Groups



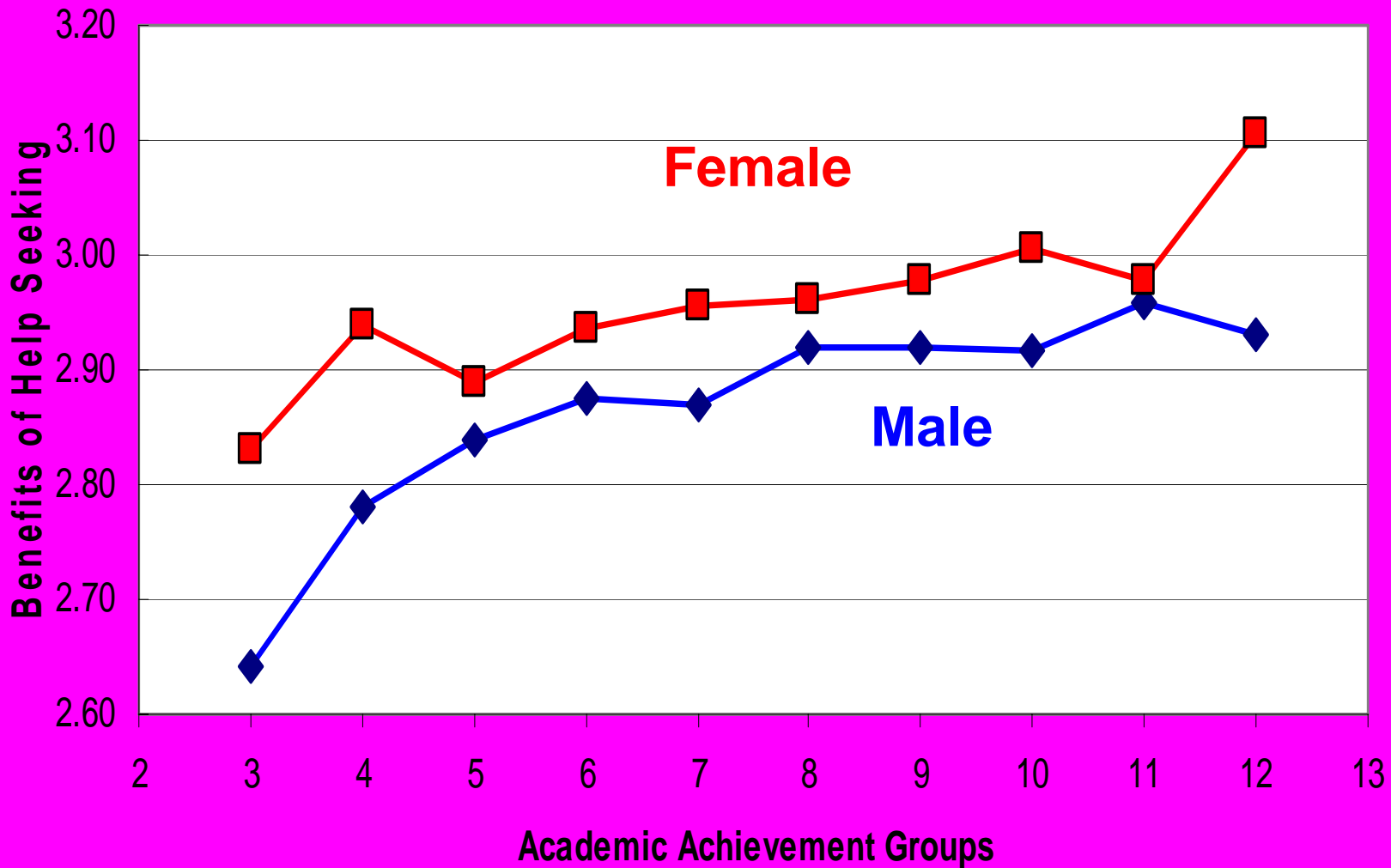
Compare Male & Female Strategy Success Attribution Across Achievement Groups



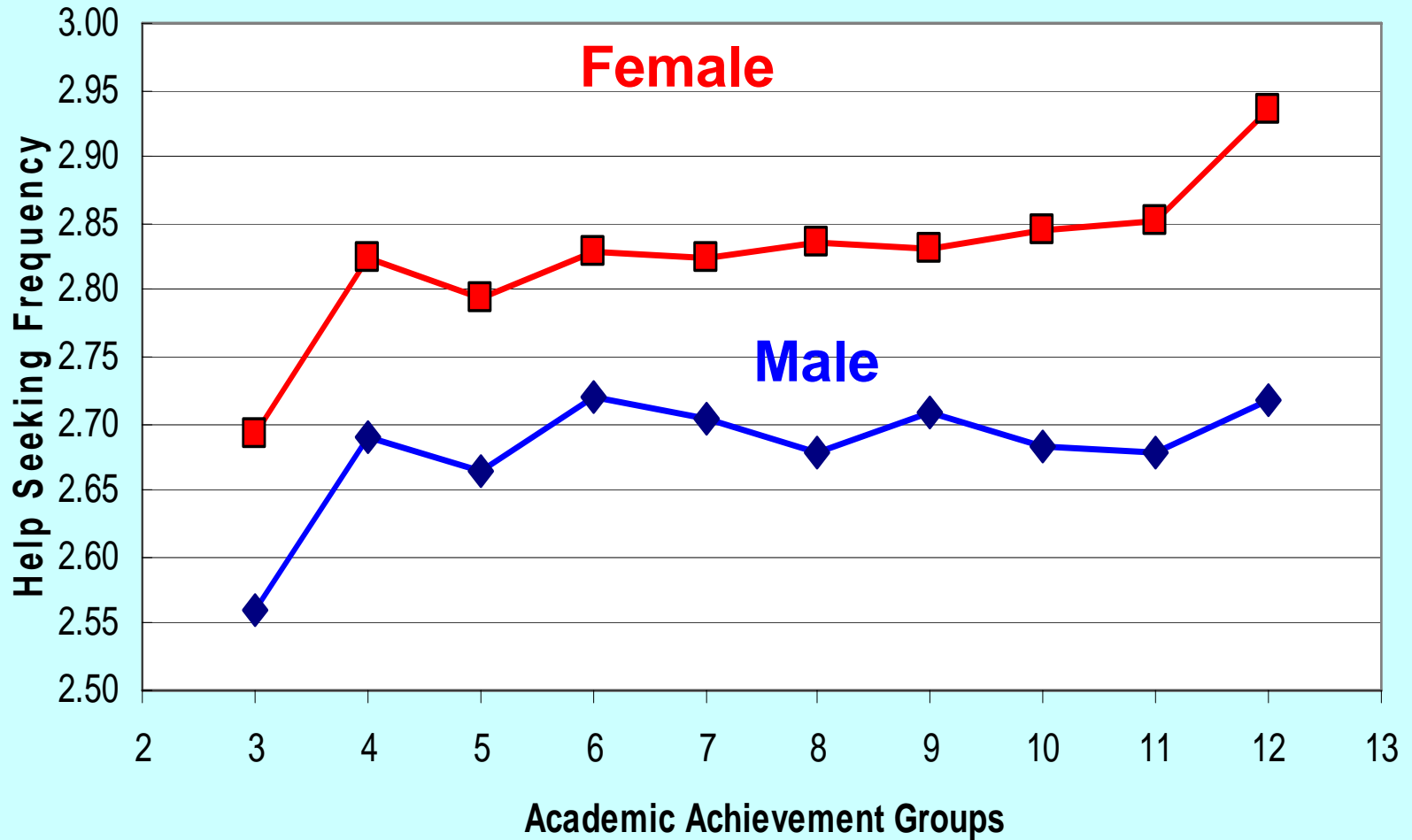
Relations between Costs of Help Seeking and Academic Achievement of Males and Females



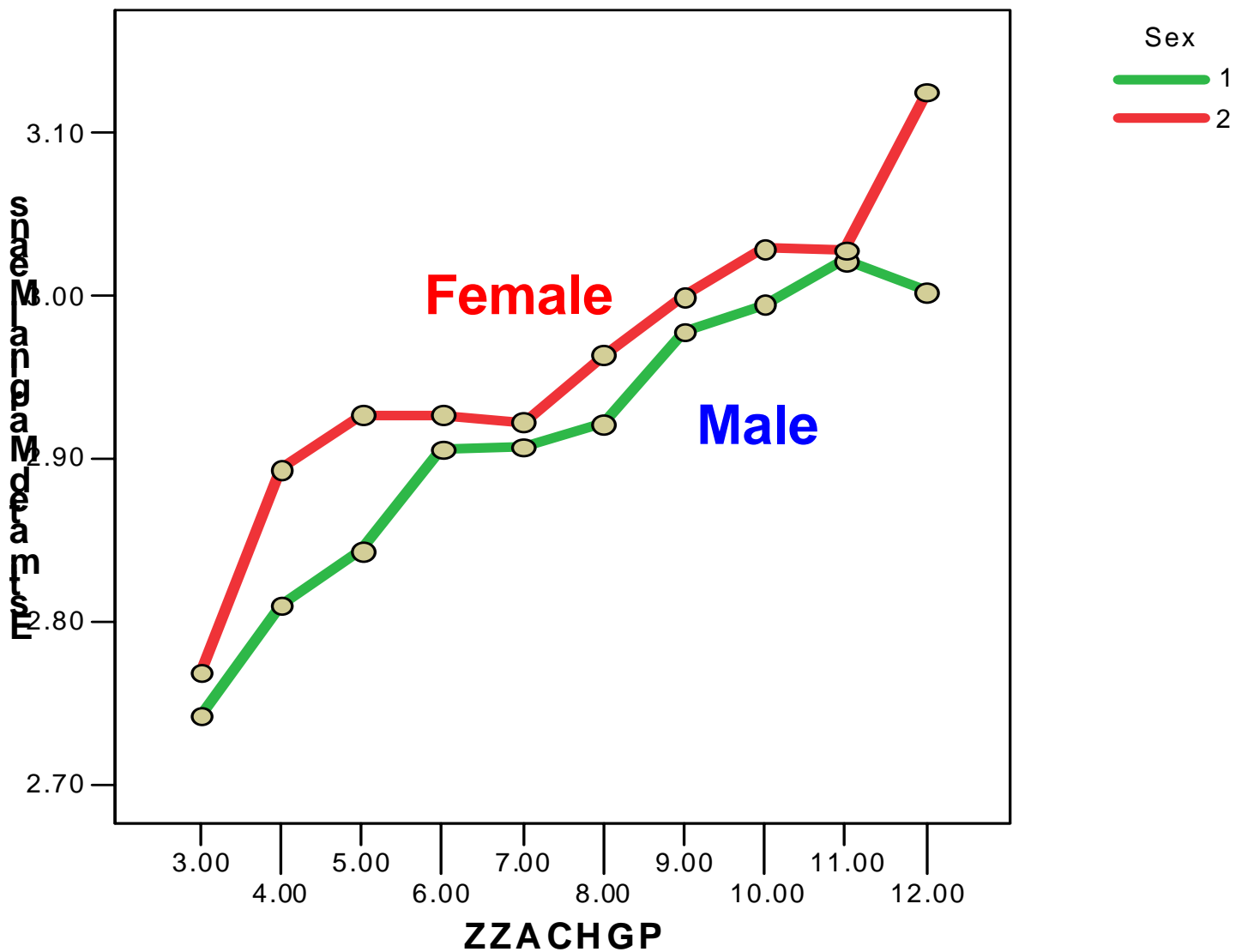
Relations between Benefits of Help Seeking and Academic Achievement for Males and Females



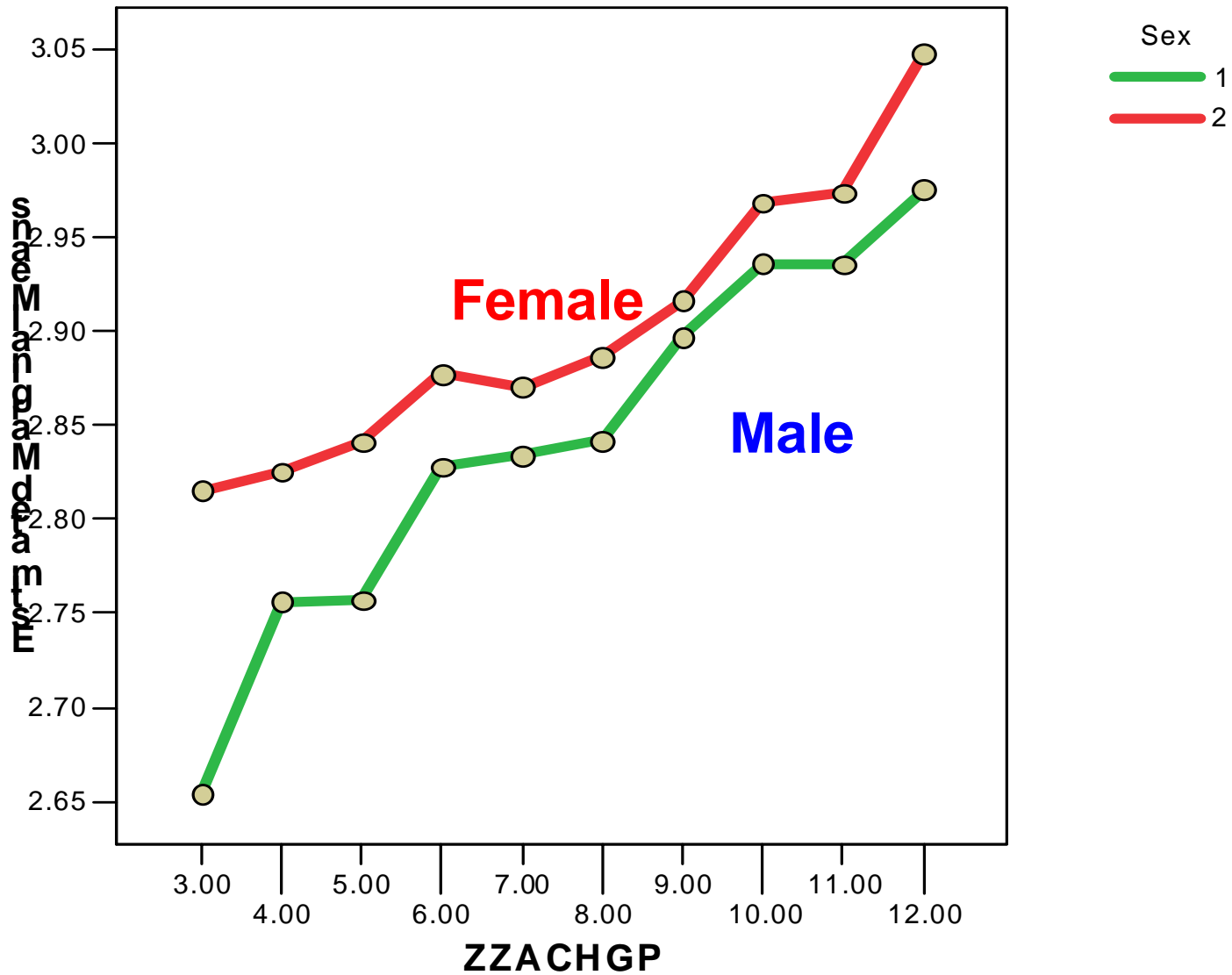
Relation between Help Seeking Frequency and Academic Achievement for Males and Females



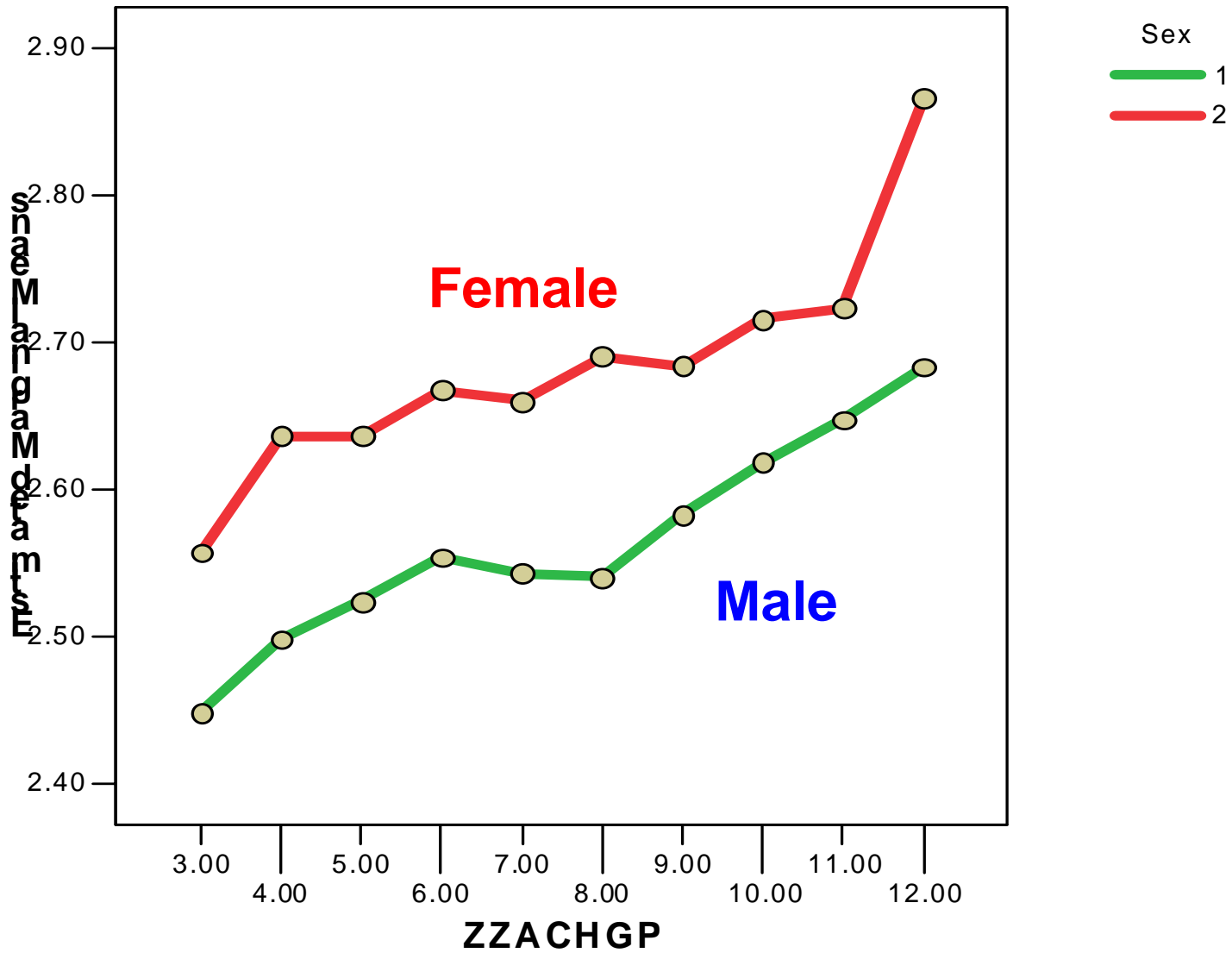
Estimated Marginal Means of VALUE OF SCHOOL WORK



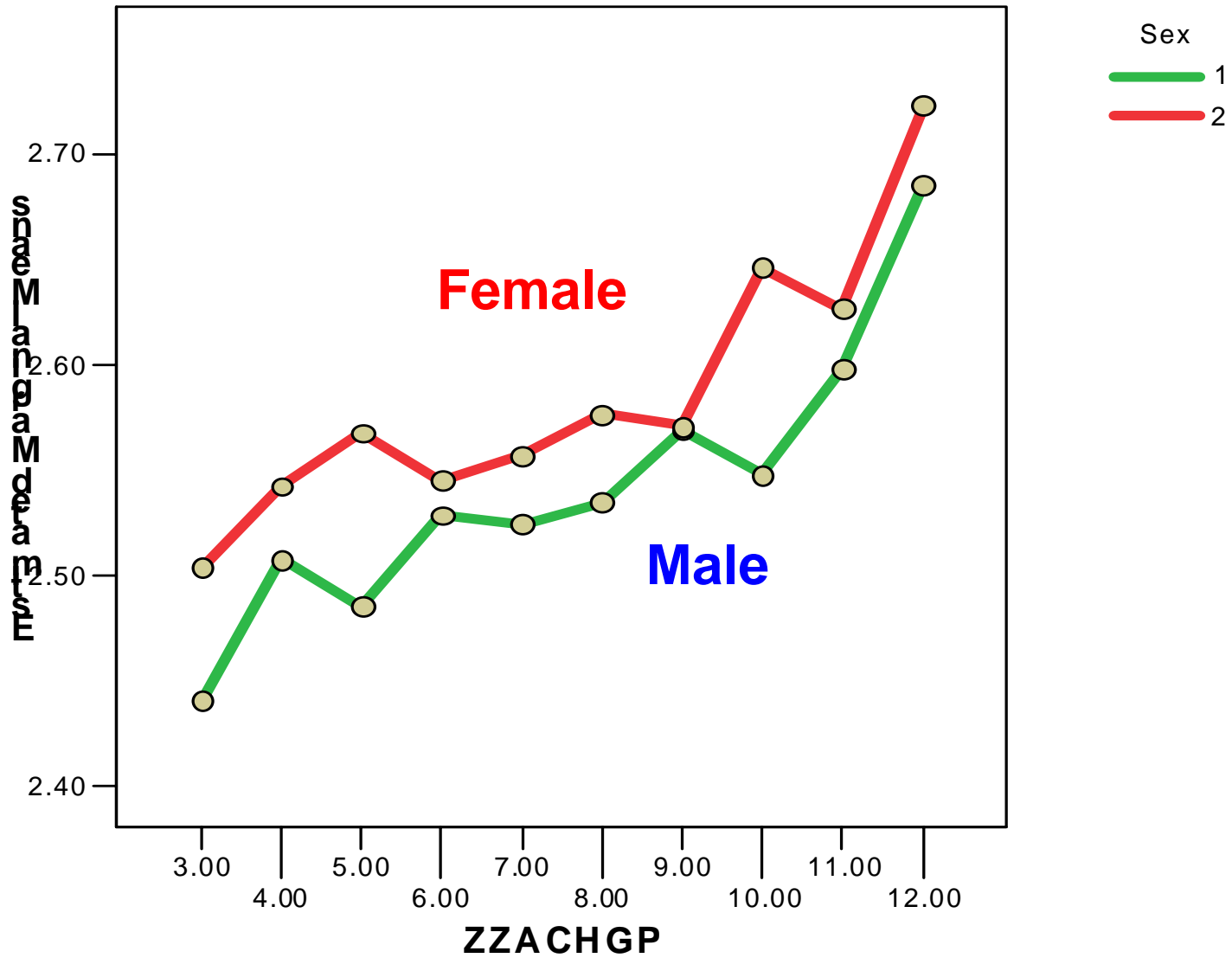
Estimated Marginal Means of EDUCATION AIMS



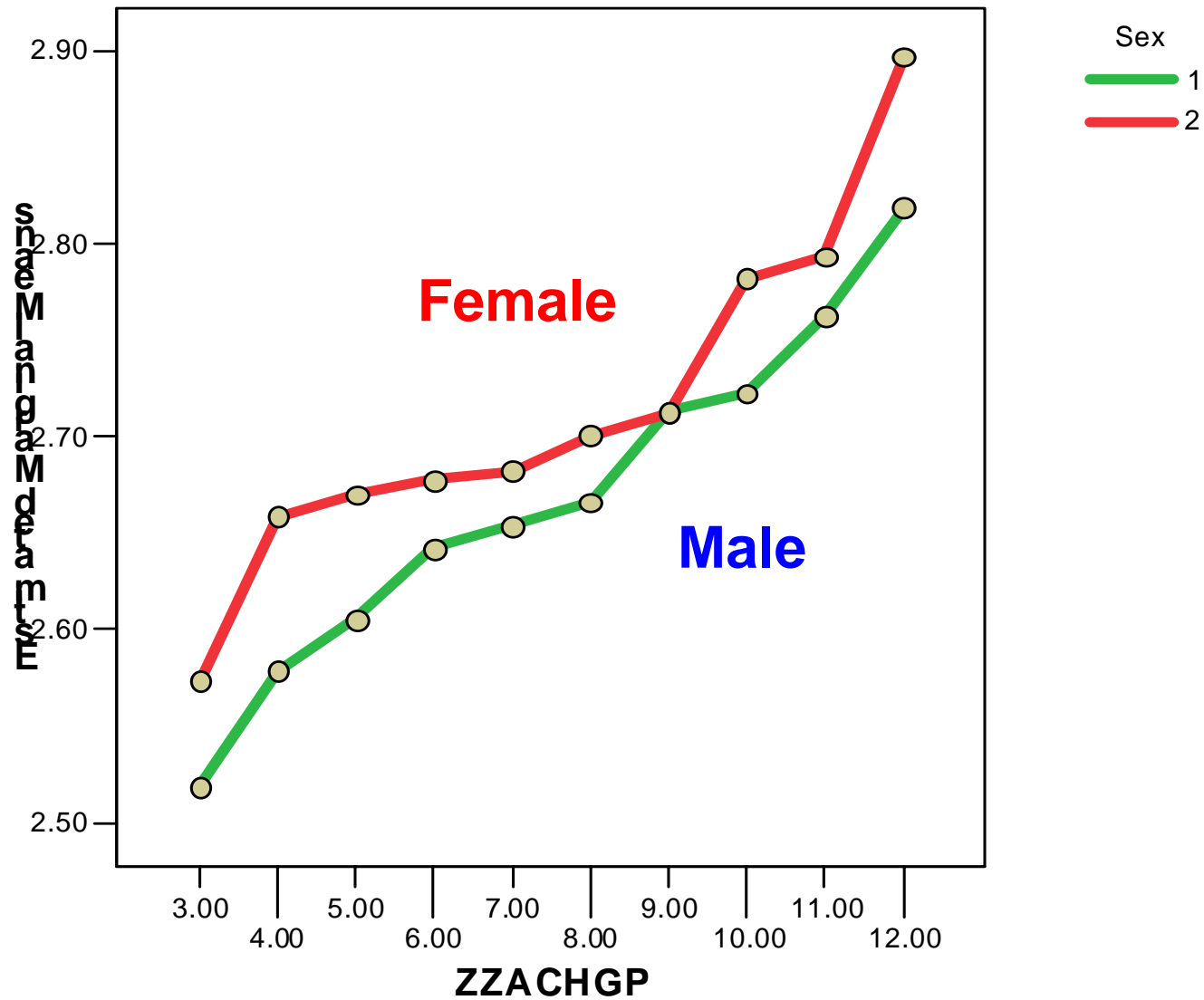
Estimated Marginal Means of STUDY PLAN



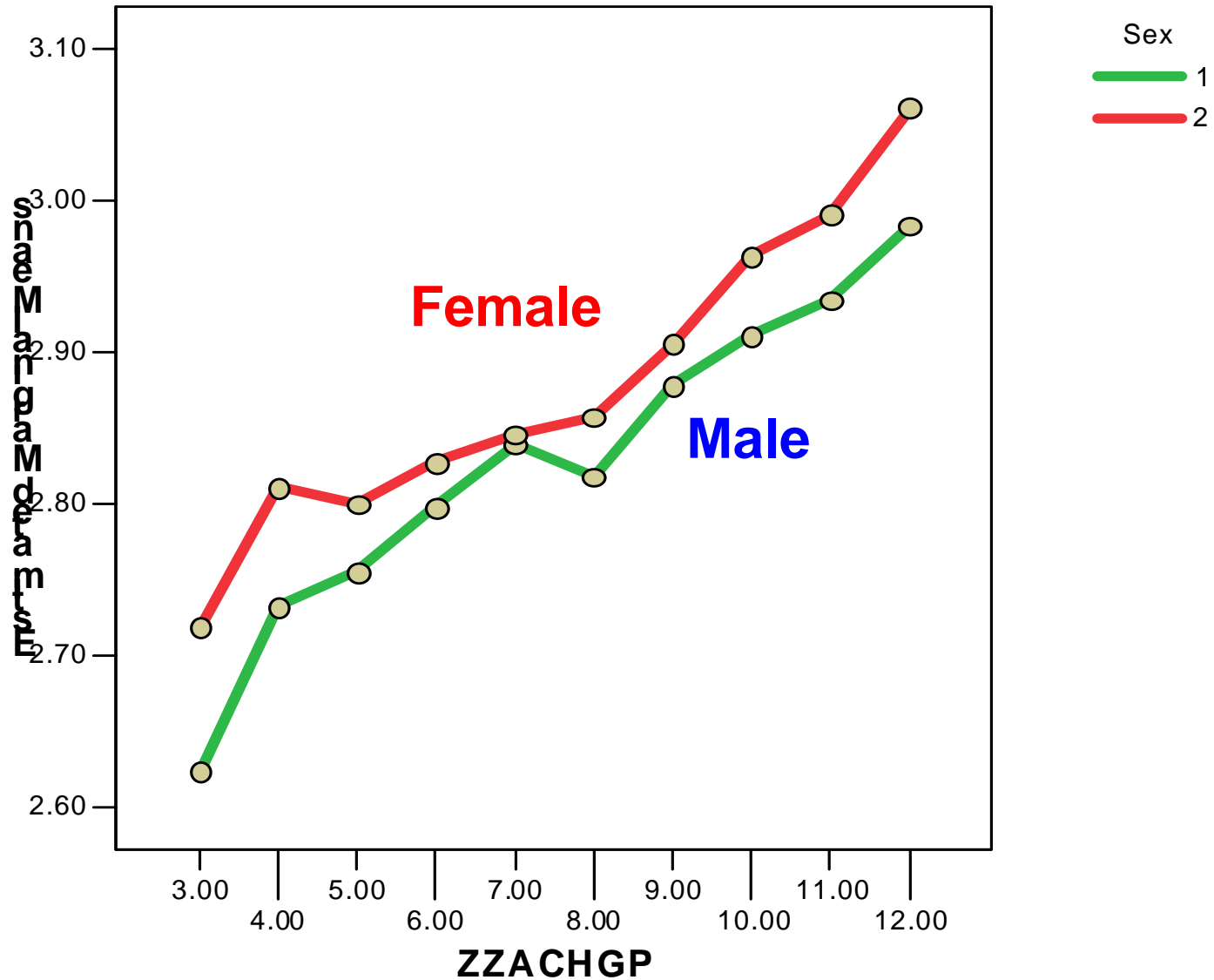
Estimated Marginal Means of GOAL SETTING



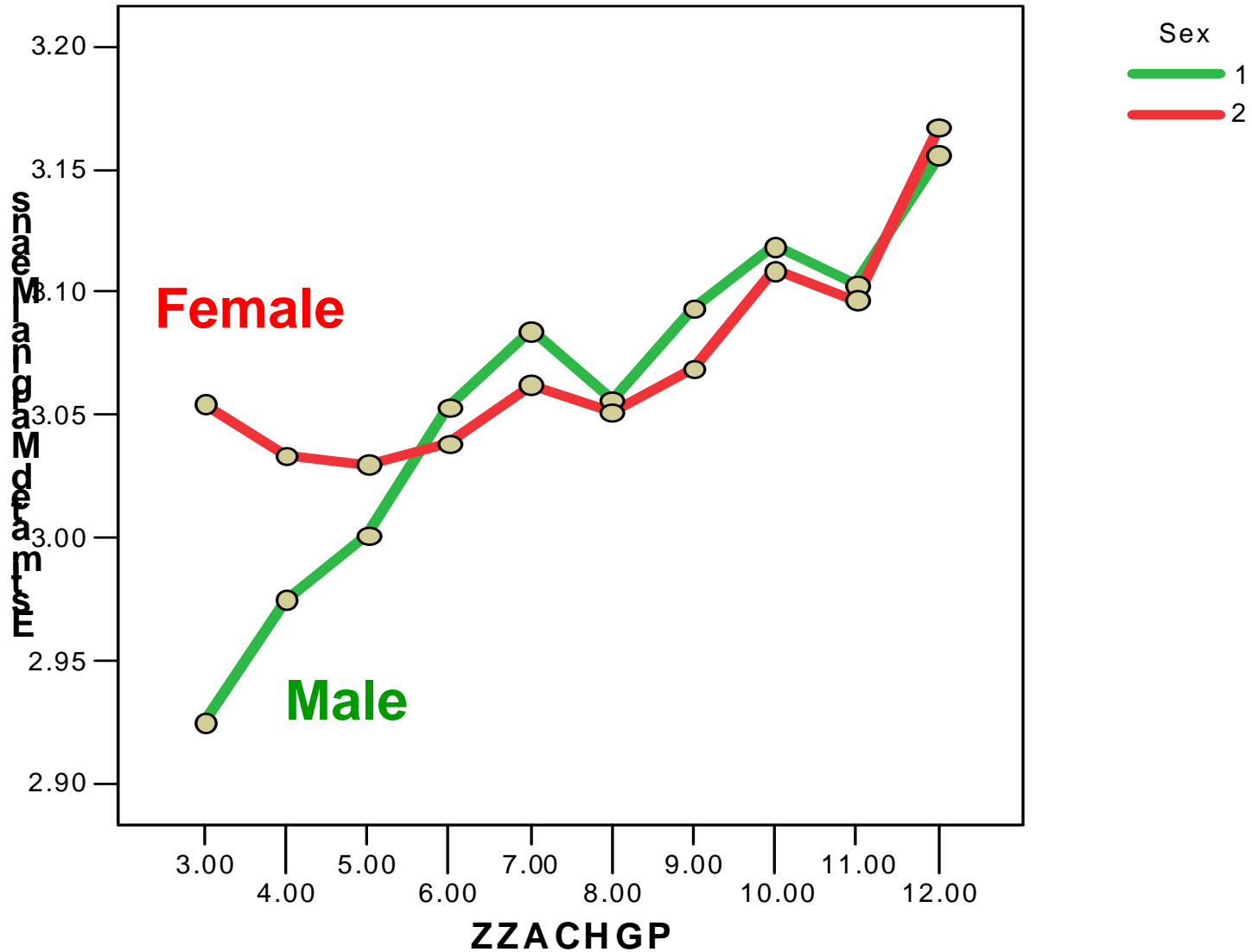
Estimated Marginal Means of ACADEMIC MONITORING



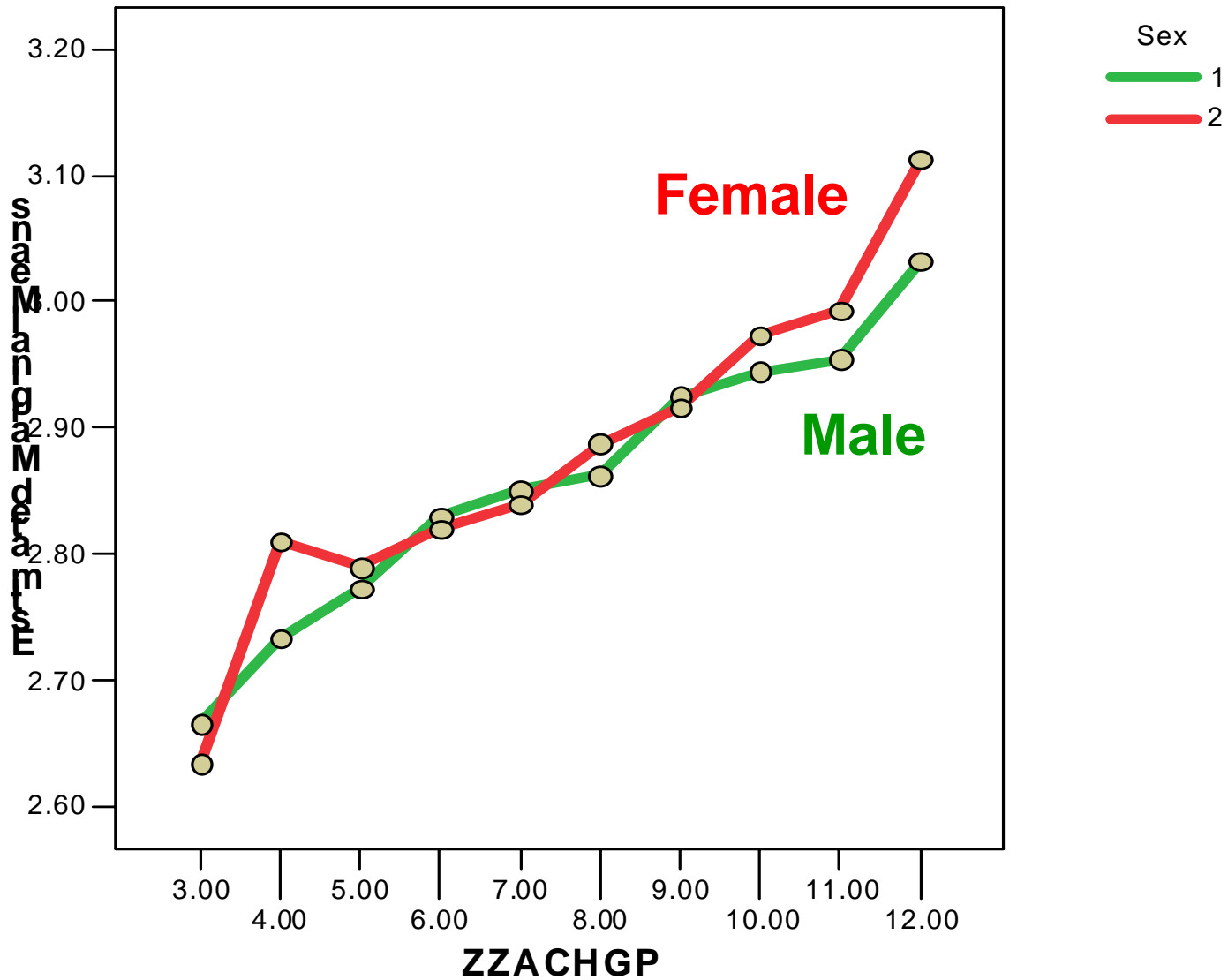
Estimated Marginal Means of CHANGE TO IMPROVE



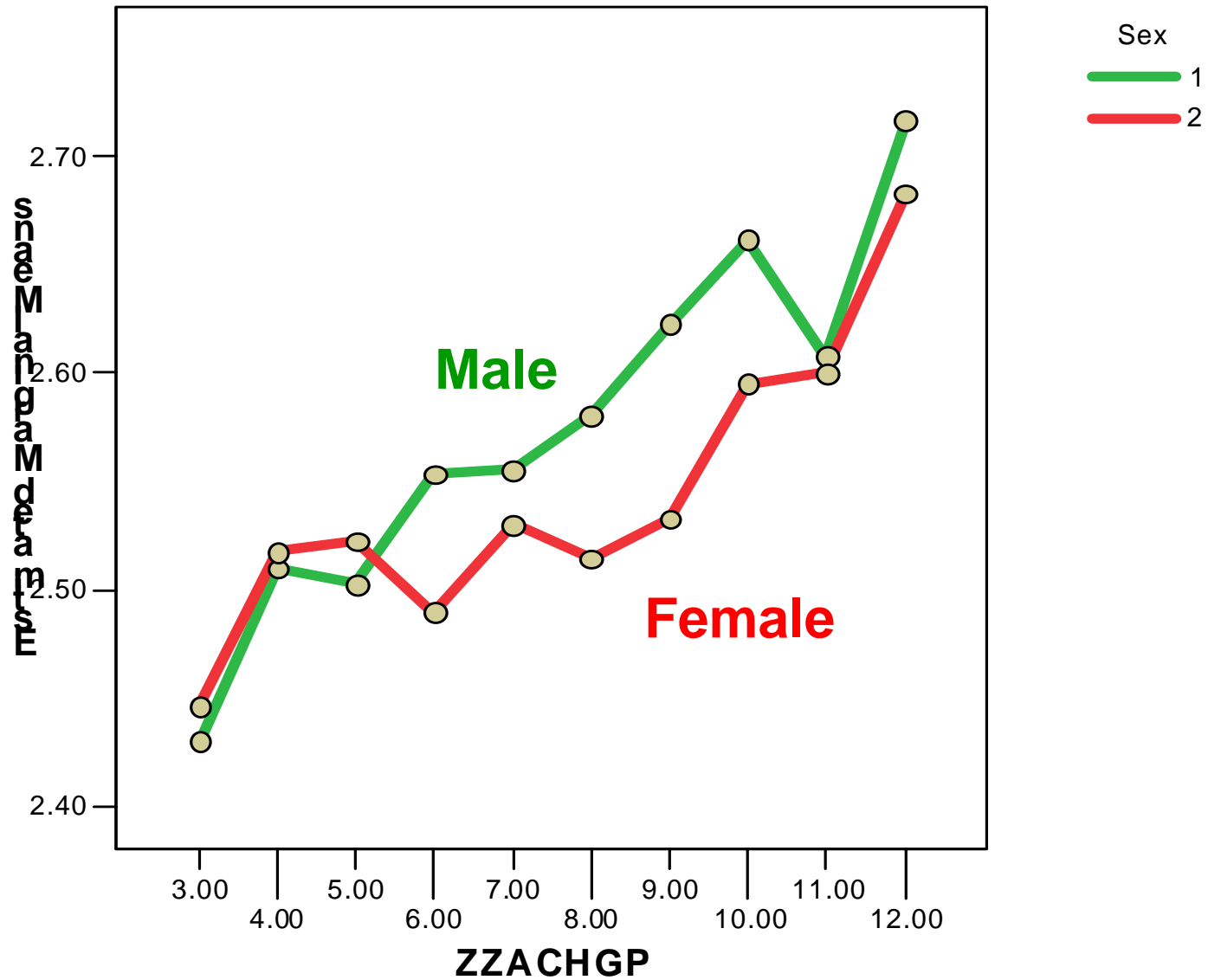
Estimated Marginal Means of INQUISITIVENESS



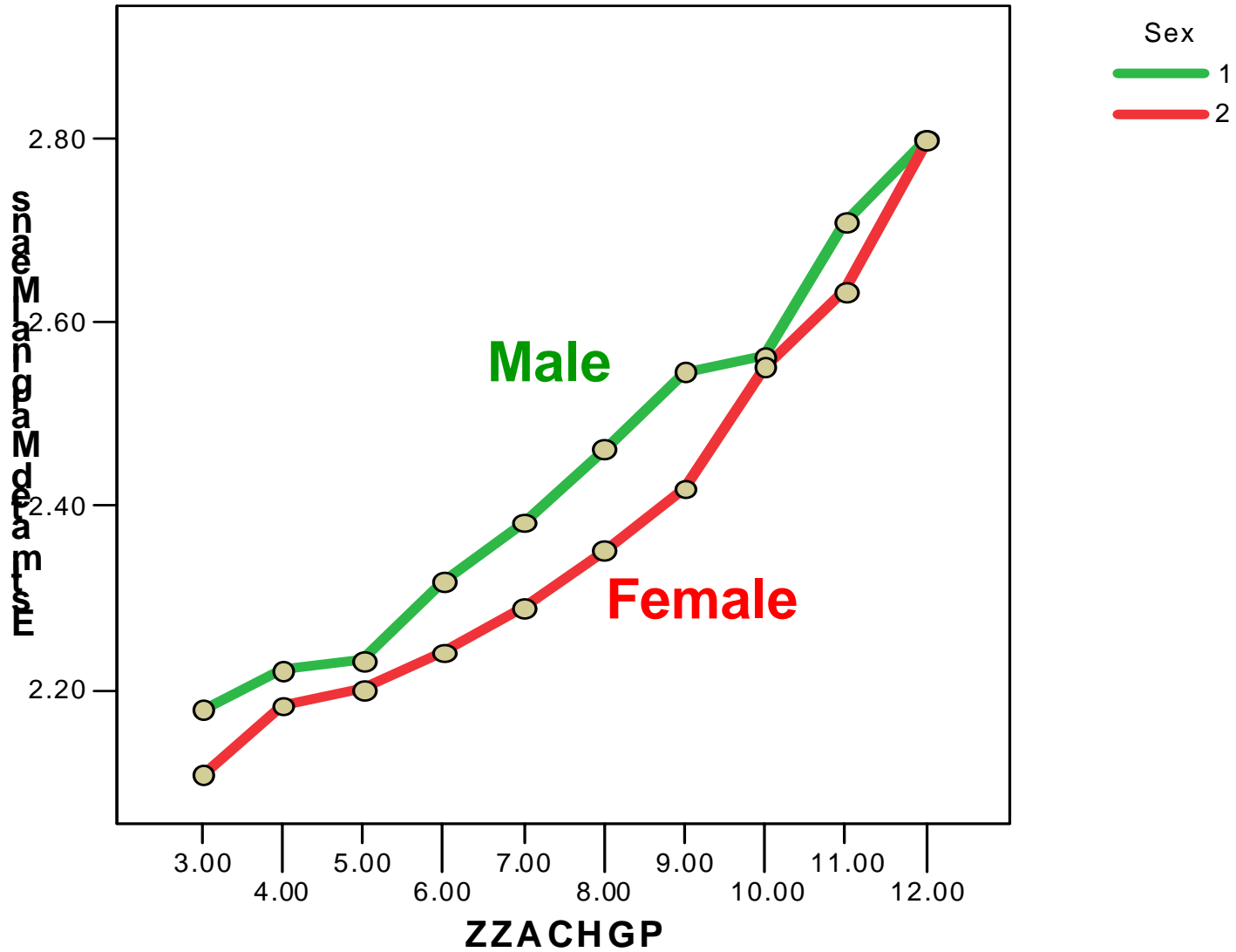
Estimated Marginal Means of ACADEMIC AFFECT



Estimated Marginal Means of ACADEMIC INITIATION



Estimated Marginal Means of ACADEMIC SELF CONCEPT





西寶國小九十學年度下學期中高年級學生自主學習一覽表

三年級

| 姓名 | 學習項目 | 指導老師 | 預計所需時間 | 通過日期 | |
|-----|----------------------------|------|-------------|------|------|
| | | | | 自我檢核 | 老師檢核 |
| 李慧中 | 閱讀：5本書 | 賴木蘭 | 10/09-10/24 | | |
| 張鈞 | 1.跳舞：酷龍舞曲 | 夏瑞晶 | 2個月 | | |
| | 2.電腦：製作網頁 8頁：包含音樂、動畫、圖片 | 張偉翰 | 10/23-11/23 | | |
| 曾毓棻 | 閱讀：5本書 | 賴木蘭 | 10/09-10/24 | | |
| 黃筑彥 | 音樂：直笛 | 蘇玉華 | | | |
| 郭穎頻 | 音樂：鋼琴 | 蘇玉華 | | | |
| 陳軍 | 音樂：鋼琴 | 蘇玉華 | | | |
| 楊涵鈺 | 畫漫畫 | 蕭嘉木 | | | |

四年級

| 姓名 | 學習項目 | 指導老師 | 預計所需時間 | 通過日期 |
|----|------|------|--------|------|
|----|------|------|--------|------|

小小氣象台



一雲的變化

二年五班 黃愈婷 著

我的感想

從小我就對雲很有興趣，覺得它們是大自然的魔術師，有時候它像個穿著白色衣服的新娘；有時候像個披黑色風衣的巫婆，非常神奇。

原本我不知道雲的形成、分類，但是經過我不斷的觀察記錄、查詢資料，最後會找到答案的，我又獲得了一項自然科學知識。

現在我是小小氣象家，常常會仰望著天空，觀察雲的變化，預測今天的天氣。雖然有時候不準，但是我覺得非常好玩，希望下次我能觀察星星跟天氣的關係。

黃愈婷

91.2.5

父母希望中的女兒

<家長的話>

有一天愈婷問我：「媽媽，如果我是泥土，你會想把我捏成什麼？」我很訝異女兒提出的問題。其實孩子就像天上的雲，有不同的分類、形狀，不是父母手中的泥土，可以依照自己的期望捏成所想的成品。

就讓孩子像雲吧！有不同的特色而形成不同的天氣，不管他們是卷雲、層雲、積雲…而形成晴時多雲偶陣雨，都是上天賜予父母最珍貴的寶貝。

吳佳美

91.2.5

Recommendations:

- **Learner-centered teaching:**
 - **Maintain strength**
- **Help students to:**
 - create **meaningful goals**
 - Build strong academic **self confidence**
 - Develop adaptive **attributions** for success & failure
 - Develop **metacognition skills**
 - Take **responsibility** for own learning
 - create and use a repertoire of **thinking and reasoning strategies** to achieve complex learning goals
 - Develop, apply, and assess their own **strategic learning skills**

Recommendations (Cont.)

- Hold **appropriate expectations** of students
- **Teachers** play a major interactive role between the student and the learning environment
- Create a **supportive learning environment**:
 - Rich & stimulating
 - Emotionally and psychologically safe
- Disseminate research findings to **students** and **parents**
- **Share** good practices

Thank you!