BUILDING BETTER DISCIPLINE STRATEGIES FOR SCHOOLS BY FUZZY LOGICS

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1

CONTENTS

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2

Introduction

- In 2006, "**Zero Corporal Punishment**" Act had put into gear in Taiwan.

- The Act provides a new direction that teachers **cannot** use **corporal punishment** anymore in campus.

3

Introduction

- According to the Ministry's report, 2011 statistics of school discipline events, the number of serious **conflicts rose** in campus from **78** in 2003 to **377** in 2010 (Ministry of Education, 2011).

- The conflict growth rate indicates up to **4.8 times** in this period.

4

What kind of discipline strategies are more acceptable by teachers?

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Which discipline strategies are more effective in schools?

This study aims to detect the acceptance and effectiveness of discipline strategies.

Literature Review

- **Discipline** has been defined as teachers for **educational purposes**, dealing with their students' behaviors, which includes various **advantages** or **disadvantages** enacted by collective or individual treatments.

Literature Review

- From the behavior control's view, the **control influences** can be classified as **rewards** and **punishments**.

- **Rewards** include bonuses, prizes, give praise, and excellent reviews.

- **Punishment**s contain blaming, warning, impose a mental or physical suffering (Etzioni, 1975).

Literature Review

- Charles (1999) suggested that the **treatment system** should be consolidated into the following **three** dimensions:

- 1. **Preventive discipline** refers to providing interesting content in the classroom, when students engage in the designed activities, they have no time to undertake improper behaviors.

8

Literature Review

- (2) **Supportive discipline** refers to helping students to back to their jobs, enabling them to achieve self-control.

- (3) **Corrective discipline** refers to termination of students' inappropriate behaviors, resetting their acceptable behaviors while retaining their dignity.

9

Literature Review

- In 2006, the "Basic Education Act" amendment in the 8th and 15th related to "prohibition of corporal punishment" has clearly designated that **government should protect students from corporal punishment in schools.**

10

Literature Review

- Taiwan became the 109th nations that the **legislative decision** must **implement zero corporal punishment** in schools.

Literature Review

- What are teachers really concern? Following the related "**Acts**", "**Guidelines**", and "**Measures**" for school discipline, we integrated the related strategies by their timing and fittest to students.

- Then, we classified the strategies into the following **three domains**: **positive**, **general**, and **special discipline**.

12

Methods-Research Framework
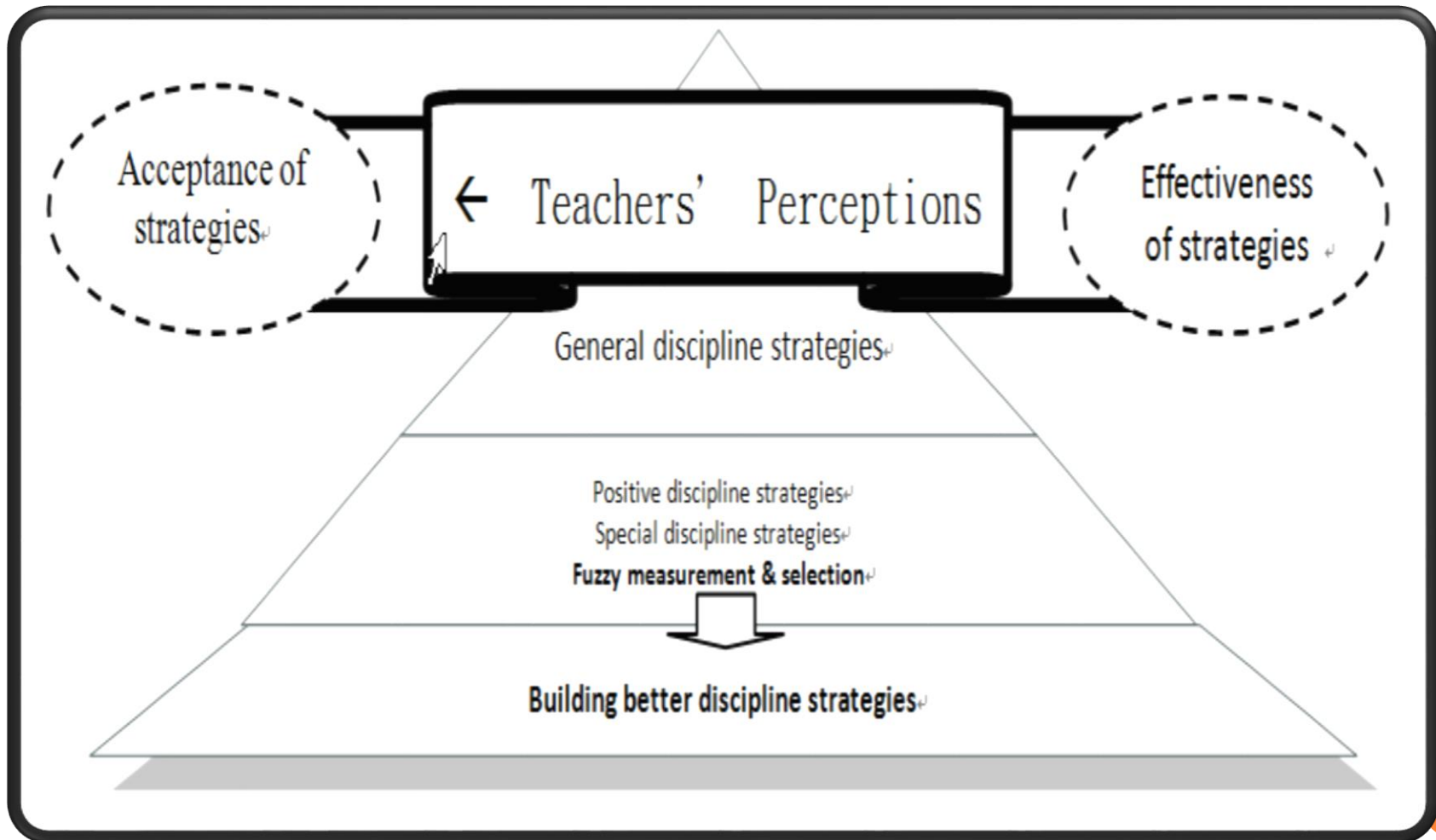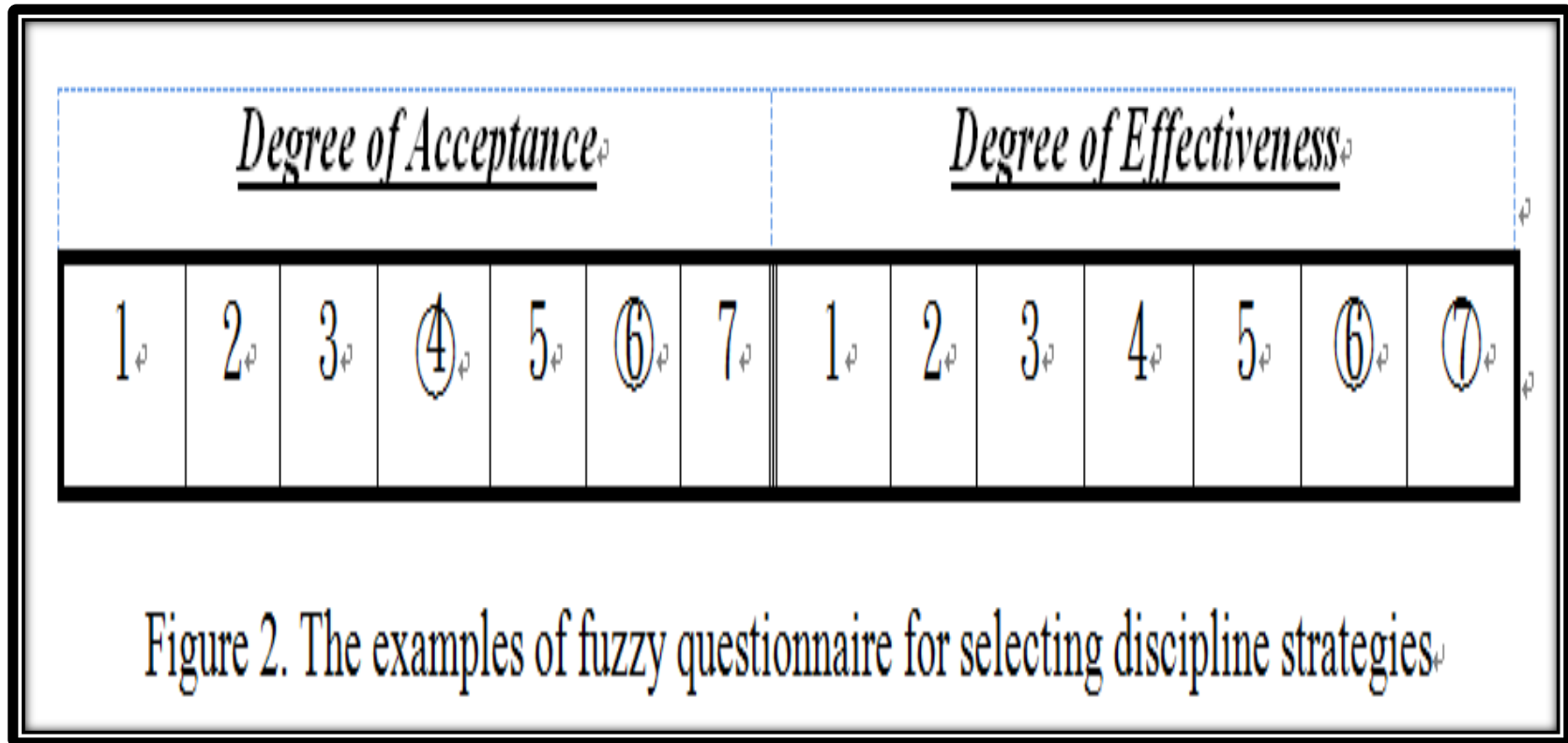
Methods-**Instrument Design**

- We collected **29 related discipline** strategies which based on the literature review.

- After inviting **seven professors/experts** to provide their comments, we follow their suggestions to delete improper strategies.

- Finally, the selected **20 discipline strategies** were assigned to "**positive** discipline", "**general** discipline", or "**special** discipline" domain respectively.

14

CLASSIFY THE DISCIPLINE STRATEGIES TO RELATED DOMAIN

Classification	Codes	Discipline strategies
Positive discipline	1-1	Integrated life events in classroom management
	1-2	Leading students to participate volunteering activities
	1-3	Praising students in oral frequently
	1-4	Grant awards, small merit, and work incentives
General discipline	2-1	Using student's oral apology
	2-2	Using student's written introspection
	2-3	Adjusting student's seating
	2-4	Asking students to stand to reflect
	2-5	Increasing student's proper job (such as penalty wrote)
	2-6	Asking students to participate public services (such as play a daily helper)
	2-7	Notify parents to associate to solve
	2-8	Deferring students to stay after school
	2-9	Depriving students class miss time
	2-10	Giving a warning, a small or a big punishment
Special discipline	3-1	Asking for assistance from the office of student affairs
	3-2	Asking for assistance from the office of student counseling
	3-3	Transfer students to other school
	3-4	Handed over their parent to implement bring-back-discipline for five days
	3-5	Offering high-risk-caring courses
	3-6	Asking for assistance from the police office

Methods-**Fuzzy Questionnaire**

Degree of Acceptance							Degree of Effectiveness						
1	2	3	④	5	⑥	7	1	2	3	4	5	⑥	⑦

Figure 2. The examples of fuzzy questionnaire for selecting discipline strategies

Methods- Fuzzy means and Distance

$$\overline{Fx} = [\frac{1}{n}\sum_{i=1}^{n} a_i, \frac{1}{n}\sum_{i=1}^{n} b_i] \cdots$$

$$d(\chi_1, \chi_2) = \left| C_i - C_j \right| + \left| \frac{\ln(1 + |A_i|)}{|A_i|} - \frac{\ln(1 + |A_j|)}{|A_j|} \right|$$

17
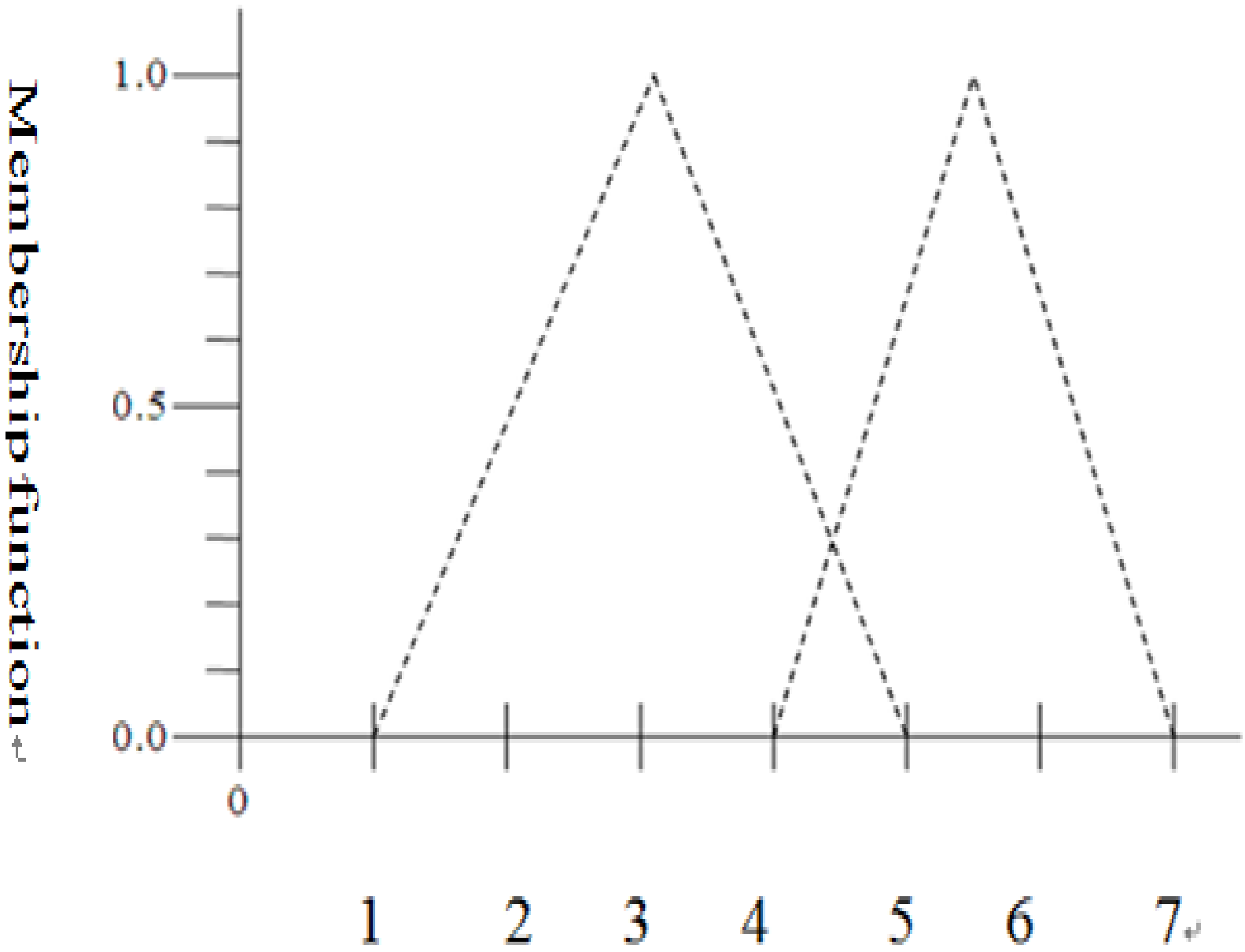
FUZZY DISTANCE

- Let U be the universe of discourse.

- Let $\{\chi_i=(a, b, c), i=1,2,3\}$ be three samples from U, with the center

$$C_i = \frac{a_i + b_i + c_i}{3}, \quad h_i=1, \text{ and area } A_i = \frac{(c_i - a_i)^* h_i}{2}$$

- The distance between the triangle samples χ1 and χ2 is defined as χ1→[C1,A1] , and χ2→[C2,A2].

- How to calculate the fuzzy distance between **acceptance** and **effectiveness**?

- Let two sets of interval data be χ_1=[2,4,6] and χ_2=[4,5.5,7], then χ_1=[(2+4+6)/3,(6-2)/2]=[4;2], χ_2=[(4+5.5+7)/3,(7-4)/2]=[5.5;1.5)].

- We can get the following fuzzy distance:

$$d(z_1, z_2) = |4 - 5.5| + \left| \frac{\ln(1+2)}{2} - \frac{\ln(1+1.5)}{1.5} \right| = 1.53$$

21

Results-Teachers' perceptions on **acceptance** and **effectiveness** of the discipline strategies

| Classification	Codes	Fuzzy Means (Acceptance)	Centroids	Rank	Fuzzy means (Effectiveness)	Centroids	Rank
Positive discipline	1-1	[4.91,6.04]	5.81	2	[4.76,5.54]	5.33	2
	1-2	[4.74,5.82]	5.61	3	[4.18,5.31]	5.08	4
	1-3	[5.05,6.14]	5.91	1	[4.54,5.67]	5.44	1
	1-4	[4.68,5.79]	5.56	4	[4.31,5.40]	5.18	3
General discipline	2-1	[4.33,5.46]	5.23	4	[3.76,4.87]	4.64	7
	2-2	[4.27,5.40]	5.17	5	[3.78,4.89]	4.66	6
	2-3	[4.46,5.61]	5.37	2	[4.12,5.24]	5.01	1
	2-4	[4.06,5.24]	4.99	6	[3.71,4.84]	4.60	9
	2-5	[4.00,5.17]	4.92	7	[3.70,4.86]	4.61	8
	2-6	[4.39,5.55]	5.31	3	[3.95,5.11]	4.87	3
	2-7	[4.49,5.66]	5.41	1	[4.11,5.25]	5.01	1
	2-8	[3.82,4.98]	4.74	9	[3.91,5.03]	4.80	4
	2-9	[3.76,4.88]	4.65	10	[3.86,4.99]	4.76	5
	2-10	[3.86,5.00]	4.76	8	[3.65,4.81]	4.57	10
Special discipline	3-1	[4.27,5.42]	5.18	1	[3.93,5.05]	4.82	2
	3-2	[4.15,5.30]	5.06	2	[3.78,4.91]	4.67	3
	3-3	[3.76,4.87]	4.64	6	[3.62,4.70]	4.48	4
	3-4	[3.79,4.93]	4.69	5	[3.45,4.57]	4.34	6
	3-5	[3.91,5.06]	4.82	4	[3.58,4.69]	4.46	5
	3-6	[4.08,5.22]	4.98	3	[4.02,5.13]	4.91	1

Results- The distance between acceptance and effectiveness of discipline strategies

Classification	Codes	Discipline strategies	Fuzzy Distance* D=C_a-C_e	Ranking in Domain	Ranking in Total
Positive discipline	1-1	Integrated life events in classroom management	0.48	2	16
	1-2	Leading students to participate volunteering activities	0.54	4	19
	1-3	Praising students in oral frequently	0.49	3	17
	1-4	Grant awards, small merit, and work incentives	0.38	1	11
General discipline	2-1	Using student's oral apology	0.59	10	20
	2-2	Using student's written introspection	0.51	9	18
	2-3	Adjusting student's seating	0.36	5	8
	2-4	Asking students to stand to reflect	0.38	6	11
	2-5	Increasing student's proper job (such as penalty wrote)	0.31	4	6
	2-6	Asking students to participate public services (such as play a daily helper)	0.44	8	15
	2-7	Notify parents to associate to solve	0.40	7	14
	2-8	Deferring students to stay after school	0.07	1	1
	2-9	Depriving students class miss time	0.10	2	3
	2-10	Giving a warning, a small or a big punishment	0.20	3	5
Special discipline	3-1	Asking for assistance from the office of student affairs	0.36	4	8
	3-2	Asking for assistance from the office of student counseling	0.38	6	11
	3-3	Transfer students to other school	0.16	2	4
	3-4	Handed over their parent to implement bring-back-discipline for five days	0.35	3	7
	3-5	Offering high-risk-caring courses	0.36	4	8
	3-6	Asking for assistance from the police office	0.07	1	1

*Note. D=C_a-C_e in terms of the distance D equals to center of acceptance minus the center of effectiveness calculated by fuzzy measure.

23

SELECTION FOR BETTER DISCIPLINE STRATEGIES

- **Teachers' Perception of Acceptance**
  - Low
  - Moderate
  - High

- **Teachers' Perception of Effective**
  - Low
  - Moderate
  - High

24
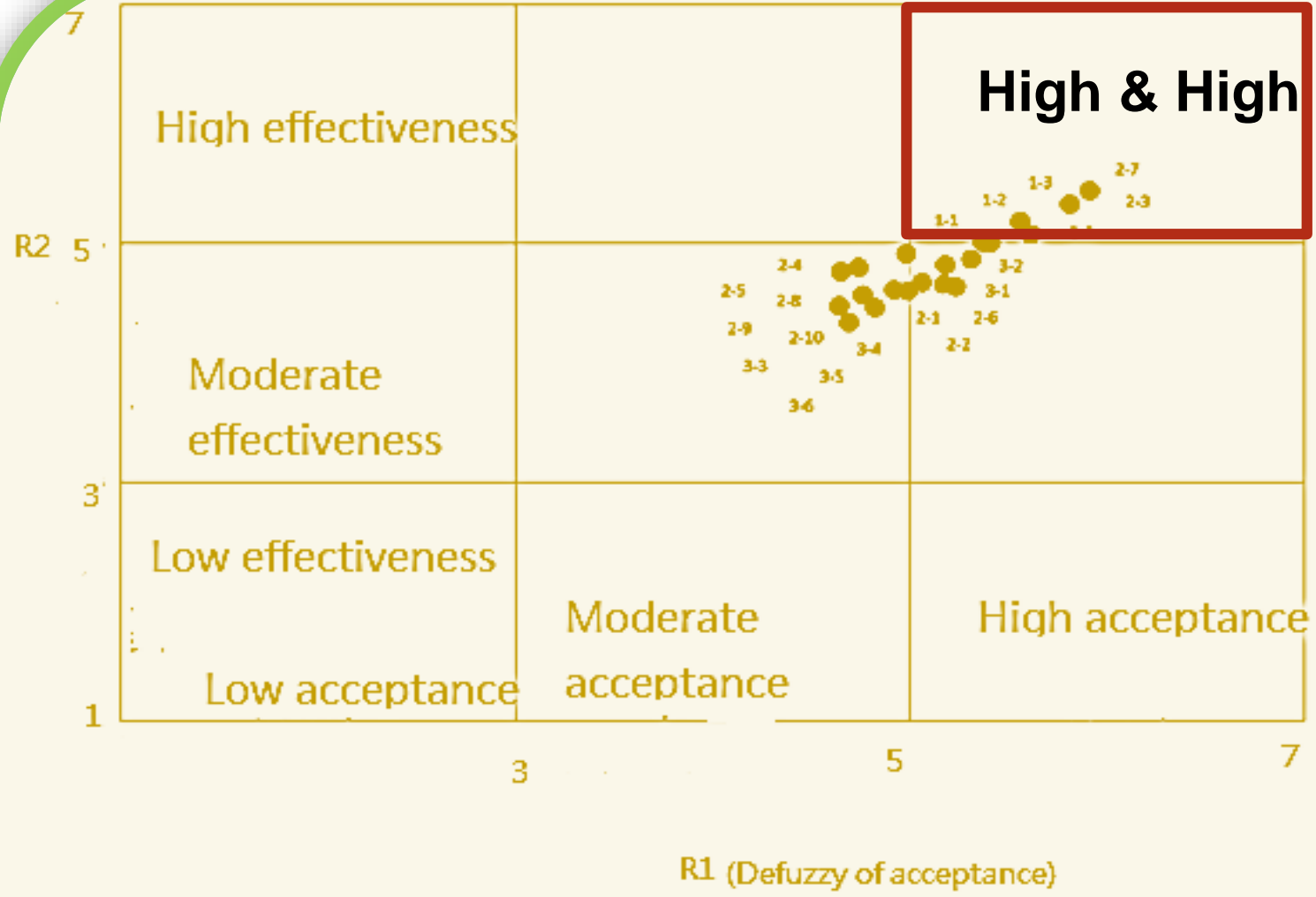
Classify	Codes	Discipline strategies	Moderate A&E	High A& Moderate E	High A&E
Positive discipline	1-1	Integrated life events in classroom management			✓
	1-2	Leading students to participate volunteering activities			✓
	1-3	Praising students in oral frequently			✓
	1-4	Grant awards, small merit, and work incentives			✓
General discipline	2-1	Using student's oral apology		✓	
	2-2	Using student's written introspection		✓	
	2-3	Adjusting student's seating			✓
	2-4	Asking students to stand to reflect	✓		
	2-5	Increasing student's proper job (such as penalty wrote)	✓		
	2-6	Asking students to participate public services (such as play a daily helper)		✓	
	2-7	Notify parents to associate to solve			✓
	2-8	Deferring students to stay after school	✓		

Conclusions

- **Discipline** issues have disturbed most of teachers for a long time.

- Since the "**Zero Corporal Punishment**" Act put into gear, there is only one way to go building better discipline strategies for teachers.

Conclusions

- In this study, we applied **fuzzy measurement** to determine which discipline strategies fit to schools.

- The participants provide a lot of useful information for us to make a **better decision** to **select discipline strategies**.

28

Conclusions

- According to the fuzzy data transforming, we suggest **six high acceptable and effective discipline strategies** for teachers.

THANKS FOR YOUR LISTENING!!!